Supplementary materials



Supplementary Figure S1. Pipeline implemented to infer local ancestry in the Brangus population.



Supplementary Figure S2. Distribution of standardized iHS values for BoLA SNPs in Brangus breed.



Supplementary Figure S3. Distribution of Brahman fraction in the Brangus animals analyzed. The composition was estimated using Structure software.

Supplementary Table S1. List of cattle genes located within the candidate region intervals obtained from the inter-population FST analysis.

Ensembl Gene ID Associated Gene Name Gene Start (bp) Gene End (bp) Gene type Strand Description

ENSBTAG00000012451 7186801 7193645 protein\_coding -1 "MHC class II antigen; Major histocompatibility complex, class II, DM beta; Major histocompatibility complex, class II, DM beta-chain, expressed; Uncharacterized protein [Source:UniProtKB/TrEMBL;Acc:Q58DW7]"

ENSBTAG00000015730 HLA-DMA 7204350 7207052 protein\_coding 1 "major histocompatibility complex, class II, DM alpha [Source:HGNC Symbol;Acc:HGNC:4934]"

ENSBTAG00000006490 HLA-DOA 7218687 7220390 protein\_coding -1 "major histocompatibility complex, class II, DO alpha [Source:HGNC Symbol;Acc:HGNC:4936]"

ENSBTAG00000011074 BRD2 7240060 7247225 protein\_coding 1 "bromodomain containing 2 [Source:HGNC Symbol;Acc:HGNC:1103]"

ENSBTAG00000000601 COL11A2 7290455 7318840 protein\_coding -1 "collagen type XI alpha 2 chain [Source:HGNC Symbol;Acc:HGNC:2187]"

ENSBTAG00000000602 RXRB 7320233 7326944 protein\_coding -1 "retinoid X receptor beta [Source:HGNC Symbol;Acc:HGNC:10478]"

ENSBTAG00000008191 SLC39A7 7327198 7331690 protein\_coding 1 "solute carrier family 39 member 7 [Source:HGNC Symbol;Acc:HGNC:4927]"

ENSBTAG00000020927 HSD17B8 7331889 7334005 protein\_coding 1 "estradiol 17-beta-dehydrogenase 8 [Source:RefSeq peptide;Acc:NP\_001039789]"

ENSBTAG00000018884 RING1 7338399 7341500 protein\_coding 1 "ring finger protein 1 [Source:HGNC Symbol;Acc:HGNC:10018]"

ENSBTAG00000002643 VPS52 7370938 7388536 protein\_coding -1 "VPS52, GARP complex subunit [Source:HGNC Symbol;Acc:HGNC:10518]"

ENSBTAG00000002648 RPS18 7388703 7393361 protein\_coding 1 "ribosomal protein S18 [Source:HGNC Symbol;Acc:HGNC:10401]"

ENSBTAG00000025669 B3GALT4 7394229 7395863 protein\_coding 1 "beta-1,3-galactosyltransferase 4 [Source:HGNC Symbol;Acc:HGNC:919]"

ENSBTAG00000016824 WDR46 7396126 7405471 protein\_coding -1 "WD repeat domain 46 [Source:HGNC Symbol;Acc:HGNC:13923]"

ENSBTAG00000010723 PFDN6 7405845 7407102 protein\_coding 1 "prefoldin subunit 6 [Source:HGNC Symbol;Acc:HGNC:4926]"

ENSBTAG00000016827 RGL2 7407899 7414957 protein\_coding -1 "ral guanine nucleotide dissociation stimulator like 2 [Source:HGNC Symbol;Acc:HGNC:9769]"

ENSBTAG00000016828 TAPBP 7415849 7425523 protein\_coding -1 "TAP binding protein (tapasin) [Source:HGNC Symbol;Acc:HGNC:11566]"

ENSBTAG00000016830 DAXX 7429817 7434186 protein\_coding -1 "death domain associated protein [Source:HGNC Symbol;Acc:HGNC:2681]"

ENSBTAG00000001631 KIFC1 7512780 7527613 protein\_coding 1 "kinesin family member C1 [Source:HGNC Symbol;Acc:HGNC:6389]"

ENSBTAG00000001634 PHF1 7528759 7534103 protein\_coding 1 "PHD finger protein 1 [Source:HGNC Symbol;Acc:HGNC:8919]"

ENSBTAG00000001635 CUTA 7534224 7535613 protein\_coding -1 "cutA divalent cation tolerance homolog [Source:HGNC Symbol;Acc:HGNC:21101]"

ENSBTAG00000020975 SYNGAP1 7537952 7566784 protein\_coding 1 "synaptic RasGTPase activating protein 1 [Source:HGNC Symbol;Acc:HGNC:11497]"

ENSBTAG00000038888 ZBTB9 7568876 7571700 protein\_coding 1 "zinc finger and BTB domain containing 9 [Source:HGNC Symbol;Acc:HGNC:28323]"

ENSBTAG00000000428 BAK1 7655892 7658885 protein\_coding -1 "BCL2 antagonist/killer 1 [Source:HGNC Symbol;Acc:HGNC:949]"

ENSBTAG00000011057 7662064 7667198 protein\_coding 1 "GGNBP1 protein; Uncharacterized protein [Source:UniProtKB/TrEMBL;Acc:A6H760]"

ENSBTAG00000013245 ITPR3 7687261 7756803 protein\_coding 1 "inositol 1,4,5-trisphosphate receptor type 3 [Source:HGNC Symbol;Acc:HGNC:6182]"

ENSBTAG00000033603 IP6K3 7758144 7820913 protein\_coding -1 "inositol hexakisphosphate kinase 3 [Source:HGNC Symbol;Acc:HGNC:17269]"

ENSBTAG00000015538 LEMD2 7842000 7858371 protein\_coding -1 "LEM domain containing 2 [Source:HGNC Symbol;Acc:HGNC:21244]"

ENSBTAG00000015550 MLN 7865124 7872669 protein\_coding -1 "motilin [Source:HGNC Symbol;Acc:HGNC:7141]"

ENSBTAG00000013632 GRM4 8084930 8188237 protein\_coding -1 "glutamate metabotropic receptor 4 [Source:HGNC Symbol;Acc:HGNC:4596]"

ENSBTAG00000020595 KCTD20 10355458 10391460 protein\_coding 1 "potassium channel tetramerization domain containing 20 [Source:HGNC Symbol;Acc:HGNC:21052]"

ENSBTAG00000011126 STK38 10395680 10436813 protein\_coding -1 "serine/threonine-protein kinase 38 [Source:RefSeq peptide;Acc:NP\_001075071]"

ENSBTAG00000040006 SRSF3 10481198 10487651 protein\_coding 1 "serine and arginine rich splicing factor 3 [Source:HGNC Symbol;Acc:HGNC:10785]"

ENSBTAG00000025617 10528444 10544184 protein\_coding -1 "40S ribosomal protein S4 [Source:UniProtKB/TrEMBL;Acc:A2VE06]"

ENSBTAG00000008353 CDKN1A 10560499 10568780 protein\_coding 1 "cyclin dependent kinase inhibitor 1A [Source:HGNC Symbol;Acc:HGNC:1784]"

ENSBTAG00000045551 10574088 10576698 protein\_coding 1 "Uncharacterized protein [Source:UniProtKB/TrEMBL;Acc:G3MX73]"

ENSBTAG00000010728 10610918 10617305 protein\_coding 1

ENSBTAG00000007514 CPNE5 10632882 10734550 protein\_coding -1 "copine 5 [Source:HGNC Symbol;Acc:HGNC:2318]"

ENSBTAG00000002376 PPIL1 10748954 10769296 protein\_coding -1 "peptidylprolylisomerase like 1 [Source:HGNC Symbol;Acc:HGNC:9260]"

ENSBTAG00000002393 C6orf89 10773265 10809544 protein\_coding 1 "chromosome 6 open reading frame 89 [Source:HGNC Symbol;Acc:HGNC:21114]"

ENSBTAG00000002092 PI16 10836790 10848749 protein\_coding 1 "peptidase inhibitor 16 [Source:HGNC Symbol;Acc:HGNC:21245]"

ENSBTAG00000033453 10854192 10873802 protein\_coding -1 "MTCH1 protein; Uncharacterized protein [Source:UniProtKB/TrEMBL;Acc:A7YY65]"

ENSBTAG00000014172 FGD2 10892083 10918349 protein\_coding 1 "FYVE, RhoGEF and PH domain containing 2 [Source:HGNC Symbol;Acc:HGNC:3664]"

ENSBTAG00000000396 PIM1 11051544 11055416 protein\_coding -1 "Pim-1 proto-oncogene, serine/threonine kinase [Source:HGNC Symbol;Acc:HGNC:8986]"

ENSBTAG00000045936 11093689 11132861 protein\_coding -1 "Uncharacterized protein [Source:UniProtKB/TrEMBL;Acc:G3N0P9]"

ENSBTAG00000002369 TMEM217 11109499 11132859 protein\_coding -1 "transmembrane protein 217 [Source:HGNC Symbol;Acc:HGNC:21238]"

ENSBTAG00000014253 TBC1D22B 11133036 11206519 protein\_coding 1 "TBC1 domain family member 22B [Source:HGNC Symbol;Acc:HGNC:21602]"

ENSBTAG00000008321 RNF8 11229765 11267153 protein\_coding 1 "ring finger protein 8 [Source:HGNC Symbol;Acc:HGNC:10071]"

ENSBTAG00000017091 CMTR1 11303506 11356260 protein\_coding 1 "cap methyltransferase 1 [Source:HGNC Symbol;Acc:HGNC:21077]"

ENSBTAG00000012069 11358158 11373693 protein\_coding -1 "Coiled-coil domain-containing protein 167 [Source:UniProtKB/Swiss-Prot;Acc:A1A4P9]"

ENSBTAG00000005888 MDGA1 11530878 11594184 protein\_coding -1 "MAM domain containing glycosylphosphatidylinositol anchor 1 [Source:HGNC Symbol;Acc:HGNC:19267]"

ENSBTAG00000000527 ZFAND3 11712802 12040961 protein\_coding 1 "zinc finger AN1-type containing 3 [Source:HGNC Symbol;Acc:HGNC:18019]"

ENSBTAG00000000529 BTBD9 12405340 12462065 protein\_coding -1 "BTB domain containing 9 [Source:HGNC Symbol;Acc:HGNC:21228]"

ENSBTAG00000012703 GLO1 12483468 12509232 protein\_coding -1 "glyoxalase I [Source:HGNC Symbol;Acc:HGNC:4323]"

ENSBTAG00000014063 DNAH8 12550367 12883939 protein\_coding 1 "dynein axonemal heavy chain 8 [Source:HGNC Symbol;Acc:HGNC:2952]"

ENSBTAG00000018224 GLP1R 12913192 12940627 protein\_coding 1 "glucagon like peptide 1 receptor [Source:HGNC Symbol;Acc:HGNC:4324]"

ENSBTAG00000001074 SAYSD1 12964407 12971106 protein\_coding -1 "SAYSVFN motif domain containing 1 [Source:HGNC Symbol;Acc:HGNC:21025]"

ENSBTAG00000011112 KCNK5 13057053 13095621 protein\_coding -1 "potassium two pore domain channel subfamily K member 5 [Source:HGNC Symbol;Acc:HGNC:6280]"

ENSBTAG00000007140 13102247 13103226 protein\_coding -1 "Uncharacterized protein [Source:UniProtKB/TrEMBL;Acc:M0QVZ5]"

ENSBTAG00000010328 KCNK17 13160210 13172869 protein\_coding -1 "potassium two pore domain channel subfamily K member 17 [Source:HGNC Symbol;Acc:HGNC:14465]"

ENSBTAG00000010352 KCNK16 13175069 13181327 protein\_coding -1 "potassium two pore domain channel subfamily K member 16 [Source:HGNC Symbol;Acc:HGNC:14464]"

ENSBTAG00000027197 13389447 13520727 protein\_coding -1

ENSBTAG00000021381 DAAM2 13775149 13829110 protein\_coding 1 "dishevelled associated activator of morphogenesis 2 [Source:HGNC Symbol;Acc:HGNC:18143]"

ENSBTAG00000010449 13832466 13866950 protein\_coding -1

ENSBTAG00000017971 LRFN2 14309128 14351087 protein\_coding -1 "leucine rich repeat and fibronectin type III domain containing 2 [Source:HGNC Symbol;Acc:HGNC:21226]"

ENSBTAG00000002919 UNC5CL 14959072 14965828 protein\_coding -1 "unc-5 family C-terminal like [Source:HGNC Symbol;Acc:HGNC:21203]"

ENSBTAG00000010197 TSPO2 14974616 14975660 protein\_coding 1 "translocator protein 2 [Source:HGNC Symbol;Acc:HGNC:21256]"

ENSBTAG00000005974 APOBEC2 14985521 14998187 protein\_coding 1 "apolipoprotein B mRNA editing enzyme catalytic subunit 2 [Source:HGNC Symbol;Acc:HGNC:605]"

ENSBTAG00000005975 OARD1 15000260 15005748 protein\_coding -1 "O-acyl-ADP-ribose deacylase 1 [Source:HGNC Symbol;Acc:HGNC:21257]"

ENSBTAG00000009905 NFYA 15006380 15030449 protein\_coding 1 "nuclear transcription factor Y subunit alpha [Source:HGNC Symbol;Acc:HGNC:7804]"

ENSBTAG00000021359 15033473 15070901 protein\_coding 1 "Uncharacterized protein [Source:UniProtKB/TrEMBL;Acc:E1BL39]"

ENSBTAG00000006485 TREML1 15081867 15086276 protein\_coding -1 "triggering receptor expressed on myeloid cells like 1 [Source:HGNC Symbol;Acc:HGNC:20434]"

ENSBTAG00000007275 TREM2 15090107 15094736 protein\_coding -1 "triggering receptor expressed on myeloid cells 2 [Source:HGNC Symbol;Acc:HGNC:17761]"

ENSBTAG00000015707 TREML2 15122242 15133440 protein\_coding -1 "triggering receptor expressed on myeloid cells like 2 [Source:HGNC Symbol;Acc:HGNC:21092]"

ENSBTAG00000017593 TREM1 15148077 15163188 protein\_coding -1 "triggering receptor expressed on myeloid cells 1 [Source:HGNC Symbol;Acc:HGNC:17760]"

ENSBTAG00000014211 FOXP4 15391990 15425174 protein\_coding 1 "forkhead box P4 [Source:HGNC Symbol;Acc:HGNC:20842]"

ENSBTAG00000019343 MDFI 15467450 15482249 protein\_coding 1 "MyoD family inhibitor [Source:HGNC Symbol;Acc:HGNC:6967]"

ENSBTAG00000012384 TFEB 15507488 15514052 protein\_coding -1 "transcription factor EB [Source:RefSeq peptide;Acc:NP\_001192595]"

ENSBTAG00000003818 PGC 15560414 15568723 protein\_coding -1 "progastricsin [Source:HGNC Symbol;Acc:HGNC:8890]"

ENSBTAG00000009861 FRS3 15592219 15601796 protein\_coding -1 "fibroblast growth factor receptor substrate 3 [Source:HGNC Symbol;Acc:HGNC:16970]"

ENSBTAG00000038916 15604081 15608831 protein\_coding 1 "Mitochondrial import receptor subunit TOM6 homolog [Source:UniProtKB/TrEMBL;Acc:E1BJ53]"

ENSBTAG00000008977 15609349 15610694 protein\_coding 1 "Mitochondrial import receptor subunit TOM6 homolog [Source:UniProtKB/Swiss-Prot;Acc:Q56JY4]"

ENSBTAG00000008981 USP49 15616807 15624462 protein\_coding -1 "ubiquitin specific peptidase 49 [Source:HGNC Symbol;Acc:HGNC:20078]"

ENSBTAG00000010100 MED20 15685887 15696735 protein\_coding -1 "mediator complex subunit 20 [Source:HGNC Symbol;Acc:HGNC:16840]"

ENSBTAG00000010101 BYSL 15696925 15706220 protein\_coding 1 "bystin like [Source:HGNC Symbol;Acc:HGNC:1157]"

ENSBTAG00000010106 CCND3 15707556 15714372 protein\_coding -1 "cyclin D3 [Source:HGNC Symbol;Acc:HGNC:1585]"

ENSBTAG00000011339 TAF8 15803546 15823240 protein\_coding 1 "TATA-box binding protein associated factor 8 [Source:HGNC Symbol;Acc:HGNC:17300]"

ENSBTAG00000048230 C6orf132 15841664 15847756 protein\_coding -1 "chromosome 6 open reading frame 132 [Source:HGNC Symbol;Acc:HGNC:21288]"

ENSBTAG00000012823 GUCA1A 15901126 15908139 protein\_coding 1 "guanylatecyclase activator 1A [Source:HGNC Symbol;Acc:HGNC:4678]"

ENSBTAG00000012439 GUCA1B 15910249 15921069 protein\_coding -1 "guanylatecyclase activator 1B [Source:HGNC Symbol;Acc:HGNC:4679]"

ENSBTAG00000015301 MRPS10 15930029 15941569 protein\_coding -1 "mitochondrial ribosomal protein S10 [Source:HGNC Symbol;Acc:HGNC:14502]"

ENSBTAG00000015321 TRERF1 15948727 15988075 protein\_coding -1 "transcriptional regulating factor 1 [Source:HGNC Symbol;Acc:HGNC:18273]"

ENSBTAG00000005967 UBR2 16264297 16370157 protein\_coding 1 "ubiquitin protein ligase E3 component n-recognin 2 [Source:HGNC Symbol;Acc:HGNC:21289]"

ENSBTAG00000005971 PRPH2 16376206 16390351 protein\_coding -1 "peripherin 2 [Source:HGNC Symbol;Acc:HGNC:9942]"

ENSBTAG00000014814 GLTSCR1L 16478580 16509798 protein\_coding 1 "GLTSCR1 like [Source:HGNC Symbol;Acc:HGNC:21111]"

ENSBTAG00000018478 RPL7L1 16520006 16524508 protein\_coding 1 "ribosomal protein L7 like 1 [Source:HGNC Symbol;Acc:HGNC:21370]"

ENSBTAG00000017097 PTCRA 16554041 16559394 protein\_coding 1 "pre T-cell antigen receptor alpha [Source:HGNC Symbol;Acc:HGNC:21290]"

ENSBTAG00000015900 CNPY3 16562968 16571140 protein\_coding 1 "protein canopy homolog 3 precursor [Source:RefSeq peptide;Acc:NP\_001068907]"

ENSBTAG00000005530 GNMT 16579606 16583028 protein\_coding 1 "glycine N-methyltransferase [Source:RefSeq peptide;Acc:NP\_001193045]"

ENSBTAG00000005532 PEX6 16583122 16597410 protein\_coding -1 "peroxisomal biogenesis factor 6 [Source:HGNC Symbol;Acc:HGNC:8859]"

ENSBTAG00000005533 PPP2R5D 16602190 16625464 protein\_coding 1 "serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit delta isoform [Source:RefSeq peptide;Acc:NP\_001193287]"

ENSBTAG00000005536 16625357 16626996 protein\_coding -1 "Male-enhanced antigen 1 [Source:UniProtKB/Swiss-Prot;Acc:Q29407]"

ENSBTAG00000012746 KLHDC3 16627392 16638402 protein\_coding 1 "kelch domain containing 3 [Source:HGNC Symbol;Acc:HGNC:20704]"

ENSBTAG00000012749 CUL7 16640766 16654717 protein\_coding -1 "cullin 7 [Source:HGNC Symbol;Acc:HGNC:21024]"

ENSBTAG00000012752 MRPL2 16656285 16660495 protein\_coding -1 "mitochondrial ribosomal protein L2 [Source:HGNC Symbol;Acc:HGNC:14056]"

ENSBTAG00000012755 KLC4 16662350 16676410 protein\_coding 1 "kinesin light chain 4 [Source:HGNC Symbol;Acc:HGNC:21624]"

ENSBTAG00000012761 PTK7 16677835 16740809 protein\_coding 1 "protein tyrosine kinase 7 (inactive) [Source:HGNC Symbol;Acc:HGNC:9618]"

ENSBTAG00000012777 SRF 16747958 16754754 protein\_coding 1 "serum response factor [Source:HGNC Symbol;Acc:HGNC:11291]"

ENSBTAG00000019908 CUL9 16759132 16794939 protein\_coding 1 "cullin 9 [Source:HGNC Symbol;Acc:HGNC:15982]"

ENSBTAG00000019913 DNPH1 16795450 16797827 protein\_coding -1 "2'-deoxynucleoside 5'-phosphate N-hydrolase 1 [Source:HGNC Symbol;Acc:HGNC:21218]"

ENSBTAG00000046107 16837459 16843931 protein\_coding 1 "Uncharacterized protein [Source:UniProtKB/TrEMBL;Acc:G3N2J4]"

ENSBTAG00000045499 16856945 16859269 protein\_coding 1 "Uncharacterized protein [Source:UniProtKB/TrEMBL;Acc:G3N2R3]"

ENSBTAG00000006350 SLC22A7 16865821 16872315 protein\_coding 1 "solute carrier family 22 member 7 [Source:HGNC Symbol;Acc:HGNC:10971]"

ENSBTAG00000006357 CRIP3 16872268 16875110 protein\_coding -1 "cysteine rich protein 3 [Source:HGNC Symbol;Acc:HGNC:17751]"

ENSBTAG00000010217 ZNF318 16901443 16928392 protein\_coding -1 "zinc finger protein 318 [Source:HGNC Symbol;Acc:HGNC:13578]"

ENSBTAG00000005842 ABCC10 16961898 16981880 protein\_coding 1 "ATP binding cassette subfamily C member 10 [Source:HGNC Symbol;Acc:HGNC:52]"

ENSBTAG00000005850 DLK2 16981806 16986060 protein\_coding -1 "delta like non-canonical Notch ligand 2 [Source:HGNC Symbol;Acc:HGNC:21113]"

ENSBTAG00000011189 TJAP1 17001348 17025374 protein\_coding 1 "tight junction associated protein 1 [Source:HGNC Symbol;Acc:HGNC:17949]"

ENSBTAG00000025554 LRRC73 17025858 17028655 protein\_coding -1 "leucine rich repeat containing 73 [Source:HGNC Symbol;Acc:HGNC:21375]"

ENSBTAG00000018967 YIPF3 17031093 17035360 protein\_coding -1 "Yip1 domain family member 3 [Source:HGNC Symbol;Acc:HGNC:21023]"

ENSBTAG00000018969 POLR1C 17035500 17042367 protein\_coding 1 "RNA polymerase I subunit C [Source:HGNC Symbol;Acc:HGNC:20194]"

ENSBTAG00000018970 XPO5 17044379 17085618 protein\_coding -1 "exportin 5 [Source:HGNC Symbol;Acc:HGNC:17675]"

ENSBTAG00000006015 POLH 17092572 17115947 protein\_coding 1 "DNA polymerase eta [Source:RefSeq peptide;Acc:NP\_001029622]"

ENSBTAG00000006016 GTPBP2 17118709 17126857 protein\_coding -1 "GTP binding protein 2 [Source:HGNC Symbol;Acc:HGNC:4670]"

ENSBTAG00000009548 MAD2L1BP 17131578 17135698 protein\_coding 1 "MAD2L1 binding protein [Source:HGNC Symbol;Acc:HGNC:21059]"

ENSBTAG00000009549 RSPH9 17138206 17151448 protein\_coding 1 "radial spoke head 9 homolog [Source:HGNC Symbol;Acc:HGNC:21057]"

ENSBTAG00000025571 MRPS18A 17151843 17168154 protein\_coding -1 "mitochondrial ribosomal protein S18A [Source:HGNC Symbol;Acc:HGNC:14515]"

ENSBTAG00000005339 17255947 17269998 protein\_coding 1

ENSBTAG00000047561 17257357 17261031 protein\_coding -1

ENSBTAG00000013722 AARS2 17609853 17676803 protein\_coding -1 "alanyl-tRNAsynthetase, mitochondrial [Source:RefSeq peptide;Acc:NP\_001178140]"

ENSBTAG00000011760 MRPL14 17644487 17647839 protein\_coding -1 "mitochondrial ribosomal protein L14 [Source:HGNC Symbol;Acc:HGNC:14279]"

ENSBTAG00000032680 TMEM63B 17658118 17798269 protein\_coding 1 "transmembrane protein 63B [Source:HGNC Symbol;Acc:HGNC:17735]"

ENSBTAG00000020012 CDC5L 17731040 17771515 protein\_coding 1 "cell division cycle 5 like [Source:HGNC Symbol;Acc:HGNC:1743]"

ENSBTAG00000021066 CAPN11 17807298 17820479 protein\_coding 1 "calpain 11 [Source:HGNC Symbol;Acc:HGNC:1478]"

ENSBTAG00000015131 SLC29A1 17845969 17856150 protein\_coding 1 "solute carrier family 29 member 1 (Augustine blood group) [Source:HGNC Symbol;Acc:HGNC:11003]"

ENSBTAG00000000778 17867543 17873174 protein\_coding 1

ENSBTAG00000008076 SLC35B2 17874863 17878559 protein\_coding -1 "solute carrier family 35 member B2 [Source:HGNC Symbol;Acc:HGNC:16872]"

ENSBTAG00000013705 NFKBIE 17879935 17887291 protein\_coding -1 "NFKB inhibitor epsilon [Source:HGNC Symbol;Acc:HGNC:7799]"

ENSBTAG00000013711 17893781 17895740 protein\_coding 1

ENSBTAG00000032887 18299317 18623680 protein\_coding -1

ENSBTAG00000004104 RUNX2 18671464 18805208 protein\_coding 1 "runt related transcription factor 2 [Source:HGNC Symbol;Acc:HGNC:10472]"

ENSBTAG00000010244 CLIC5 19167358 19333272 protein\_coding -1 "chloride intracellular channel 5 [Source:HGNC Symbol;Acc:HGNC:13517]"

ENSBTAG00000003499 ENPP4 19369192 19384102 protein\_coding 1 "ectonucleotidepyrophosphatase/phosphodiesterase 4 (putative) [Source:HGNC Symbol;Acc:HGNC:3359]"

ENSBTAG00000015829 ENPP5 19388894 19395134 protein\_coding -1 "ectonucleotidepyrophosphatase/phosphodiesterase 5 (putative) [Source:HGNC Symbol;Acc:HGNC:13717]"

ENSBTAG00000009302 RCAN2 19437558 19667184 protein\_coding -1 "regulator of calcineurin 2 [Source:HGNC Symbol;Acc:HGNC:3041]"

ENSBTAG00000022736 19562567 19564449 pseudogene -1

ENSBTAG00000003632 CYP39A1 19776642 19860368 protein\_coding -1 "cytochrome P450 family 39 subfamily A member 1 [Source:HGNC Symbol;Acc:HGNC:17449]"

ENSBTAG00000016302 SLC25A27 19860795 19882823 protein\_coding 1 "solute carrier family 25 member 27 [Source:HGNC Symbol;Acc:HGNC:21065]"

ENSBTAG00000009978 TDRD6 19892715 19904104 protein\_coding 1 "tudor domain containing 6 [Source:HGNC Symbol;Acc:HGNC:21339]"

ENSBTAG00000019315 PLA2G7 19907160 19945051 protein\_coding -1 "phospholipase A2 group VII [Source:HGNC Symbol;Acc:HGNC:9040]"

ENSBTAG00000047009 ANKRD66 19953077 19966930 protein\_coding 1 "ankyrin repeat domain 66 [Source:HGNC Symbol;Acc:HGNC:44669]"

ENSBTAG00000004345 MEP1A 20014170 20040232 protein\_coding 1 "meprin A subunit alpha [Source:HGNC Symbol;Acc:HGNC:7015]"

ENSBTAG00000004347 ADGRF5 20052363 20128180 protein\_coding -1 "adhesion G protein-coupled receptor F5 [Source:HGNC Symbol;Acc:HGNC:19030]"

ENSBTAG00000021609 ADGRF1 20206358 20250984 protein\_coding -1 "adhesion G protein-coupled receptor F1 [Source:HGNC Symbol;Acc:HGNC:18990]"

ENSBTAG00000020054 TNFRSF21 20410839 20474989 protein\_coding -1 "TNF receptor superfamily member 21 [Source:HGNC Symbol;Acc:HGNC:13469]"

ENSBTAG00000000322 CD2AP 20596998 20680179 protein\_coding 1 "CD2 associated protein [Source:HGNC Symbol;Acc:HGNC:14258]"

ENSBTAG00000037687 ADGRF2 20708929 20732784 protein\_coding 1 "adhesion G protein-coupled receptor F2 [Source:HGNC Symbol;Acc:HGNC:18991]"

ENSBTAG00000002934 ADGRF4 20745536 20758331 protein\_coding 1 "adhesion G protein-coupled receptor F4 [Source:HGNC Symbol;Acc:HGNC:19011]"

ENSBTAG00000016499 OPN5 20801860 20834531 protein\_coding 1 "opsin 5 [Source:HGNC Symbol;Acc:HGNC:19992]"

ENSBTAG00000021415 PTCHD4 20893701 21091299 protein\_coding -1 "patched domain containing 4 [Source:HGNC Symbol;Acc:HGNC:21345]"

ENSBTAG00000020425 TFAP2D 22997916 23057661 protein\_coding 1 "transcription factor AP-2 delta [Source:HGNC Symbol;Acc:HGNC:15581]"

ENSBTAG00000016829 ZBTB22 7426487 7428391 protein\_coding -1 "zinc finger and BTB domain containing 22 [Source:HGNC Symbol;Acc:HGNC:13085]"

ENSBTAG00000004219 10446346 10446756 protein\_coding 1 "Uncharacterized protein [Source:UniProtKB/TrEMBL;Acc:F1MSX2]"

ENSBTAG00000010730 10627244 10628260 protein\_coding 1 "Uncharacterized protein [Source:UniProtKB/TrEMBL;Acc:G3MXD6]"

ENSBTAG00000012822 15892878 15893213 protein\_coding 1 "uncharacterized protein LOC768024 [Source:RefSeq peptide;Acc:NP\_001070551]"

ENSBTAG00000000940 TBCC 16404968 16407589 protein\_coding -1 "tubulin folding cofactor C [Source:HGNC Symbol;Acc:HGNC:11580]"

ENSBTAG00000043057 U6 10581541 10581646 snRNA -1 "U6 spliceosomal RNA [Source:RFAM;Acc:RF00026]"

ENSBTAG00000037268 16064876 16064961 miRNA 1

ENSBTAG00000044582 U6 14325179 14325285 snRNA 1 "U6 spliceosomal RNA [Source:RFAM;Acc:RF00026]"

ENSBTAG00000046881 7335323 7335432 miRNA -1

ENSBTAG00000044283 7SK 11130056 11130306 misc\_RNA 1 "7SK RNA [Source:RFAM;Acc:RF00100]"

ENSBTAG00000044482 U6 19281045 19281151 snRNA 1 "U6 spliceosomal RNA [Source:RFAM;Acc:RF00026]"

ENSBTAG00000029173 5S\_rRNA 16386089 16386203 rRNA 1 "5S ribosomal RNA [Source:RFAM;Acc:RF00001]"

ENSBTAG00000045337 bta-mir-2376 7424173 7424240 miRNA -1 "bta-mir-2376 [Source:miRBase;Acc:MI0011411]"

ENSBTAG00000043423 U6 19823239 19823345 snRNA 1 "U6 spliceosomal RNA [Source:RFAM;Acc:RF00026]"

ENSBTAG00000048116 14510929 14511022 miRNA -1

ENSBTAG00000044708 bta-mir-2377 13082433 13082501 miRNA -1 "bta-mir-2377 [Source:miRBase;Acc:MI0011412]"

ENSBTAG00000045355 5S\_rRNA 18333850 18333981 rRNA 1 "5S ribosomal RNA [Source:RFAM;Acc:RF00001]"

ENSBTAG00000043518 U6 13900773 13900880 snRNA -1 "U6 spliceosomal RNA [Source:RFAM;Acc:RF00026]"

ENSBTAG00000044331 SNORD112 11060139 11060210 snoRNA -1 "Small nucleolar RNA SNORD112 [Source:RFAM;Acc:RF01169]"

ENSBTAG00000047995 U6 17525620 17525724 snRNA -1 "U6 spliceosomal RNA [Source:RFAM;Acc:RF00026]"

ENSBTAG00000043404 U6 16194684 16194790 snRNA 1 "U6 spliceosomal RNA [Source:RFAM;Acc:RF00026]"

ENSBTAG00000042257 U6 16876168 16876274 snRNA -1 "U6 spliceosomal RNA [Source:RFAM;Acc:RF00026]"

ENSBTAG00000046576 13043442 13043516 miRNA -1

Supplementary Table S2. List of cattle genes located within the candidate region intervals obtained from the two EHH-based analyses (iHS and Rsb).

Ensembl Gene ID Associated Gene Name Gene type Strand Gene Start (bp) Gene End (bp) Description

ENSBTAG00000034493 C6orf106 protein\_coding -1 8591963 8688924 "chromosome 6 open reading frame 106 [Source:HGNC Symbol;Acc:HGNC:21215]"

ENSBTAG00000024549 SNRPC protein\_coding -1 8726525 8737237 "small nuclear ribonucleoprotein polypeptide C [Source:HGNC Symbol;Acc:HGNC:11157]"

ENSBTAG00000009267 UHRF1BP1 protein\_coding 1 8777063 8824585 "UHRF1 binding protein 1 [Source:HGNC Symbol;Acc:HGNC:21216]"

ENSBTAG00000000527 ZFAND3 protein\_coding 1 11712802 12040961 "zinc finger AN1-type containing 3 [Source:HGNC Symbol;Acc:HGNC:18019]"

ENSBTAG00000000529 BTBD9 protein\_coding -1 12405340 12462065 "BTB domain containing 9 [Source:HGNC Symbol;Acc:HGNC:21228]"

ENSBTAG00000012703 GLO1 protein\_coding -1 12483468 12509232 "glyoxalase I [Source:HGNC Symbol;Acc:HGNC:4323]"

ENSBTAG00000014063 DNAH8 protein\_coding 1 12550367 12883939 "dynein axonemal heavy chain 8 [Source:HGNC Symbol;Acc:HGNC:2952]"

ENSBTAG00000005967 UBR2 protein\_coding 1 16264297 16370157 "ubiquitin protein ligase E3 component n-recognin 2 [Source:HGNC Symbol;Acc:HGNC:21289]"

ENSBTAG00000005971 PRPH2 protein\_coding -1 16376206 16390351 "peripherin 2 [Source:HGNC Symbol;Acc:HGNC:9942]"

ENSBTAG00000014814 GLTSCR1L protein\_coding 1 16478580 16509798 "GLTSCR1 like [Source:HGNC Symbol;Acc:HGNC:21111]"

ENSBTAG00000018478 RPL7L1 protein\_coding 1 16520006 16524508 "ribosomal protein L7 like 1 [Source:HGNC Symbol;Acc:HGNC:21370]"

ENSBTAG00000017097 PTCRA protein\_coding 1 16554041 16559394 "pre T-cell antigen receptor alpha [Source:HGNC Symbol;Acc:HGNC:21290]"

ENSBTAG00000015900 CNPY3 protein\_coding 1 16562968 16571140 "protein canopy homolog 3 precursor [Source:RefSeq peptide;Acc:NP\_001068907]"

ENSBTAG00000005530 GNMT protein\_coding 1 16579606 16583028 "glycine N-methyltransferase [Source:RefSeq peptide;Acc:NP\_001193045]"

ENSBTAG00000005532 PEX6 protein\_coding -1 16583122 16597410 "peroxisomal biogenesis factor 6 [Source:HGNC Symbol;Acc:HGNC:8859]"

ENSBTAG00000005533 PPP2R5D protein\_coding 1 16602190 16625464 "serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit delta isoform [Source:RefSeq peptide;Acc:NP\_001193287]"

ENSBTAG00000005536 protein\_coding -1 16625357 16626996 "Male-enhanced antigen 1 [Source:UniProtKB/Swiss-Prot;Acc:Q29407]"

ENSBTAG00000012746 KLHDC3 protein\_coding 1 16627392 16638402 "kelch domain containing 3 [Source:HGNC Symbol;Acc:HGNC:20704]"

ENSBTAG00000012749 CUL7 protein\_coding -1 16640766 16654717 "cullin 7 [Source:HGNC Symbol;Acc:HGNC:21024]"

ENSBTAG00000012752 MRPL2 protein\_coding -1 16656285 16660495 "mitochondrial ribosomal protein L2 [Source:HGNC Symbol;Acc:HGNC:14056]"

ENSBTAG00000012755 KLC4 protein\_coding 1 16662350 16676410 "kinesin light chain 4 [Source:HGNC Symbol;Acc:HGNC:21624]"

ENSBTAG00000012761 PTK7 protein\_coding 1 16677835 16740809 "protein tyrosine kinase 7 (inactive) [Source:HGNC Symbol;Acc:HGNC:9618]"

ENSBTAG00000012777 SRF protein\_coding 1 16747958 16754754 "serum response factor [Source:HGNC Symbol;Acc:HGNC:11291]"

ENSBTAG00000019908 CUL9 protein\_coding 1 16759132 16794939 "cullin 9 [Source:HGNC Symbol;Acc:HGNC:15982]"

ENSBTAG00000019913 DNPH1 protein\_coding -1 16795450 16797827 "2'-deoxynucleoside 5'-phosphate N-hydrolase 1 [Source:HGNC Symbol;Acc:HGNC:21218]"

ENSBTAG00000046107 protein\_coding 1 16837459 16843931 "Uncharacterized protein [Source:UniProtKB/TrEMBL;Acc:G3N2J4]"

ENSBTAG00000045499 protein\_coding 1 16856945 16859269 "Uncharacterized protein [Source:UniProtKB/TrEMBL;Acc:G3N2R3]"

ENSBTAG00000006350 SLC22A7 protein\_coding 1 16865821 16872315 "solute carrier family 22 member 7 [Source:HGNC Symbol;Acc:HGNC:10971]"

ENSBTAG00000006357 CRIP3 protein\_coding -1 16872268 16875110 "cysteine rich protein 3 [Source:HGNC Symbol;Acc:HGNC:17751]"

ENSBTAG00000010217 ZNF318 protein\_coding -1 16901443 16928392 "zinc finger protein 318 [Source:HGNC Symbol;Acc:HGNC:13578]"

ENSBTAG00000005842 ABCC10 protein\_coding 1 16961898 16981880 "ATP binding cassette subfamily C member 10 [Source:HGNC Symbol;Acc:HGNC:52]"

ENSBTAG00000005850 DLK2 protein\_coding -1 16981806 16986060 "delta like non-canonical Notch ligand 2 [Source:HGNC Symbol;Acc:HGNC:21113]"

ENSBTAG00000011189 TJAP1 protein\_coding 1 17001348 17025374 "tight junction associated protein 1 [Source:HGNC Symbol;Acc:HGNC:17949]"

ENSBTAG00000025554 LRRC73 protein\_coding -1 17025858 17028655 "leucine rich repeat containing 73 [Source:HGNC Symbol;Acc:HGNC:21375]"

ENSBTAG00000018967 YIPF3 protein\_coding -1 17031093 17035360 "Yip1 domain family member 3 [Source:HGNC Symbol;Acc:HGNC:21023]"

ENSBTAG00000018969 POLR1C protein\_coding 1 17035500 17042367 "RNA polymerase I subunit C [Source:HGNC Symbol;Acc:HGNC:20194]"

ENSBTAG00000018970 XPO5 protein\_coding -1 17044379 17085618 "exportin 5 [Source:HGNC Symbol;Acc:HGNC:17675]"

ENSBTAG00000006015 POLH protein\_coding 1 17092572 17115947 "DNA polymerase eta [Source:RefSeq peptide;Acc:NP\_001029622]"

ENSBTAG00000010244 CLIC5 protein\_coding -1 19167358 19333272 "chloride intracellular channel 5 [Source:HGNC Symbol;Acc:HGNC:13517]"

ENSBTAG00000003499 ENPP4 protein\_coding 1 19369192 19384102 "ectonucleotidepyrophosphatase/phosphodiesterase 4 (putative) [Source:HGNC Symbol;Acc:HGNC:3359]"

ENSBTAG00000015829 ENPP5 protein\_coding -1 19388894 19395134 "ectonucleotidepyrophosphatase/phosphodiesterase 5 (putative) [Source:HGNC Symbol;Acc:HGNC:13717]"

ENSBTAG00000009302 RCAN2 protein\_coding -1 19437558 19667184 "regulator of calcineurin 2 [Source:HGNC Symbol;Acc:HGNC:3041]"

ENSBTAG00000022736 pseudogene -1 19562567 19564449

ENSBTAG00000003632 CYP39A1 protein\_coding -1 19776642 19860368 "cytochrome P450 family 39 subfamily A member 1 [Source:HGNC Symbol;Acc:HGNC:17449]"

ENSBTAG00000016302 SLC25A27 protein\_coding 1 19860795 19882823 "solute carrier family 25 member 27 [Source:HGNC Symbol;Acc:HGNC:21065]"

ENSBTAG00000009978 TDRD6 protein\_coding 1 19892715 19904104 "tudor domain containing 6 [Source:HGNC Symbol;Acc:HGNC:21339]"

ENSBTAG00000019315 PLA2G7 protein\_coding -1 19907160 19945051 "phospholipase A2 group VII [Source:HGNC Symbol;Acc:HGNC:9040]"

ENSBTAG00000047009 ANKRD66 protein\_coding 1 19953077 19966930 "ankyrin repeat domain 66 [Source:HGNC Symbol;Acc:HGNC:44669]"

ENSBTAG00000004345 MEP1A protein\_coding 1 20014170 20040232 "meprin A subunit alpha [Source:HGNC Symbol;Acc:HGNC:7015]"

ENSBTAG00000004347 ADGRF5 protein\_coding -1 20052363 20128180 "adhesion G protein-coupled receptor F5 [Source:HGNC Symbol;Acc:HGNC:19030]"

ENSBTAG00000021609 ADGRF1 protein\_coding -1 20206358 20250984 "adhesion G protein-coupled receptor F1 [Source:HGNC Symbol;Acc:HGNC:18990]"

ENSBTAG00000020054 TNFRSF21 protein\_coding -1 20410839 20474989 "TNF receptor superfamily member 21 [Source:HGNC Symbol;Acc:HGNC:13469]"

ENSBTAG00000000322 CD2AP protein\_coding 1 20596998 20680179 "CD2 associated protein [Source:HGNC Symbol;Acc:HGNC:14258]"

ENSBTAG00000037687 ADGRF2 protein\_coding 1 20708929 20732784 "adhesion G protein-coupled receptor F2 [Source:HGNC Symbol;Acc:HGNC:18991]"

ENSBTAG00000002934 ADGRF4 protein\_coding 1 20745536 20758331 "adhesion G protein-coupled receptor F4 [Source:HGNC Symbol;Acc:HGNC:19011]"

ENSBTAG00000016499 OPN5 protein\_coding 1 20801860 20834531 "opsin 5 [Source:HGNC Symbol;Acc:HGNC:19992]"

ENSBTAG00000021415 PTCHD4 protein\_coding -1 20893701 21091299 "patched domain containing 4 [Source:HGNC Symbol;Acc:HGNC:21345]"

ENSBTAG00000021077 protein\_coding 1 25375270 25388620 "Major histocompatibility complex, class II, DQ beta; Uncharacterized protein [Source:UniProtKB/TrEMBL;Acc:A2VDX2]"

ENSBTAG00000003352 protein\_coding 1 25423551 25424597

ENSBTAG00000013919 BOLA-DRB3 protein\_coding 1 25458594 25476944 "major histocompatibility complex, class II, DRB3 precursor [Source:RefSeq peptide;Acc:NP\_001012698]"

ENSBTAG00000038397 protein\_coding 1 25568481 25579087 "Uncharacterized protein [Source:UniProtKB/TrEMBL;Acc:F1ML60]"

ENSBTAG00000034939 protein\_coding 1 25607823 25632464 "BTNL2 protein; Uncharacterized protein [Source:UniProtKB/TrEMBL;Acc:A6QNP4]"

ENSBTAG00000000940 TBCC protein\_coding -1 16404968 16407589 "tubulin folding cofactor C [Source:HGNC Symbol;Acc:HGNC:11580]"

ENSBTAG00000045586 OR10C1 protein\_coding -1 28950035 28951009 "olfactory receptor family 10 subfamily C member 1 (gene/pseudogene) [Source:HGNC Symbol;Acc:HGNC:8165]"

ENSBTAG00000037268 miRNA 1 16064876 16064961

ENSBTAG00000044323 SNORA70 snoRNA -1 8744231 8744363 "Small nucleolar RNA SNORA70 [Source:RFAM;Acc:RF00156]"

ENSBTAG00000045034 SCARNA6 snoRNA 1 25240216 25240487 "Small Cajal body specific RNA 6 [Source:RFAM;Acc:RF00478]"

ENSBTAG00000044482 U6 snRNA 1 19281045 19281151 "U6 spliceosomal RNA [Source:RFAM;Acc:RF00026]"

ENSBTAG00000029173 5S\_rRNA rRNA 1 16386089 16386203 "5S ribosomal RNA [Source:RFAM;Acc:RF00001]"

ENSBTAG00000043423 U6 snRNA 1 19823239 19823345 "U6 spliceosomal RNA [Source:RFAM;Acc:RF00026]"

ENSBTAG00000044892 U7 snRNA 1 8738052 8738114 "U7 small nuclear RNA [Source:RFAM;Acc:RF00066]"

ENSBTAG00000043404 U6 snRNA 1 16194684 16194790 "U6 spliceosomal RNA [Source:RFAM;Acc:RF00026]"

ENSBTAG00000042257 U6 snRNA -1 16876168 16876274 "U6 spliceosomal RNA [Source:RFAM;Acc:RF00026]"