

Supplementary Material

Cow_SOX-1	MYSMMMETDLHSPGGAQAPTNLSPGAGGGGGGGGGG---SKANQDRVKRPMNAFMVWSRGQRRKMAQENPKMHNSEISKRLGAEWKVM	87
Buffalo_SOX-1	MYSMMMETDLHSPGGAQAPTNLSPGAGGGGGGGGGG---SKANQDRVKRPMNAFMVWSRGQRRKMAQENPKMHNSEISKRLGAEWKVM	88
Goat_SOX-1	MYSMMMETDLHSPGGAQAPTNLSPGAGGGGGGGGGGGSKANQDRVKRPMNAFMVWSRGQRRKMAQENPKMHNSEISKRLGAEWKVM	90
Sheep_SOX-1	MYSMMMETDLHSPGGAQAPTNLSPGAGGGGGGGGGGGSKANQDRVKRPMNAFMVWSRGQRRKMAQENPKMHNSEISKRLGAEWKVM	89
Cow_SOX-1	SEAEKRPFIDEAKRLRALHMKHEPDYKYRPRRKTTLTKKDKYSLAGLLAAGAGGGAAVAVGVGAAAVGQRLSPGGAAGGGYAHVNGW	177
Buffalo_SOX-1	SEAEKRPFIDEAKRLRALHMKHEPDYKYRPRRKTTLTKKDKYSLAGLLAAGAGGGAAVAVGVGAAAVGQRLSPGGAAGGGYAHVNGW	178
Goat_SOX-1	SEAEKRPFIDEAKRLRALHMKHEPDYKYRPRRKTTLTKKDKYSLAGLLAAGAGGGAAVAVGVGAAAVGQRLSPGGAAGGGYAHVNGW	180
Sheep_SOX-1	SEAEKRPFIDEAKRLRALHMKHEPDYKYRPRRKTTLTKKDKYSLAGLLAAGAGGGAAVAVGVGAAAVGQRLSPGGAAGGGYAHVNGW	179
Cow_SOX-1	ANGAYPGSVAAAAAAMMQEAQLAYGQHPGAGGAHPHAHPHAPHHHPHAPHNPQPMHRYDMGALQYSPISNSQGYMSASPSGYGGLP	267
Buffalo_SOX-1	ANGAYPGSVAAAAAAMMQEAQLAYGQHPGAGGAHPHAHPHAPHHHPHAPHNPQPMHRYDMGALQYSPISNSQGYMSASPSGYGGLP	268
Goat_SOX-1	ANGAYPGSVAAAAAAMMQEAQLAYGQHPGAGGAHPHAHPHAPHHHPHAPHNPQPMHRYDMGALQYSPISNSQGYMSASPSGYGGLP	270
Sheep_SOX-1	ANGAYPGSVAAAAAAMMQEAQLAYGQHPGAGGAHPHAHPHAPHHHPHAPHNPQPMHRYDMGALQYSPISNSQGYMSASPSGYGGLP	269
Cow_SOX-1	YGAAGGAHQNSAVAAAAAASSGALGALGSLVKSEPSGSPAAAHSRAPCPGDLREMISMYLPAGEGGDPAAAQSRRLHSLPPHYQGAG	357
Buffalo_SOX-1	YGAAGGAHQNSAVAAAAAASSGALGALGSLVKSEPSGSPAAAHSRAPCPGDLREMISMYLPAGEGGDPAAAQSRRLHSLPPHYQGAG	358
Goat_SOX-1	YGAAGGAHQNSAVAAAAAASSGALGALGSLVKSEPSGSPAAAHSRAPCPGDLREMISMYLPAGEGGDPAAAQSRRLHSLPPHYQGAG	360
Sheep_SOX-1	YGAAGGAHQNSAVAAAAAASSGALGALGSLVKSEPSGSPAAAHSRAPCPGDLREMISMYLPAGEGGDPAAAQSRRLHSLPPHYQGAG	359
Cow_SOX-1	AGANGTVPLTHI	369
Buffalo_SOX-1	AGANGTVPLTHI	370
Goat_SOX-1	AGANGTVPLTHI	372
Sheep_SOX-1	AGANGTVPLTHI	371

Figure S1. Comparative amino acid analysis of Sox1 gene in Cattle, buffalo, Sheep, and Goat

Cow_SOX-2	MYNMMETELKPPGQQTSGGGGGGGG-NSTAAAAGGNQKNSPDRVKRPMNAFMVWSRGQRRKMAQENPKMHNSEISKRLGAEWKLLSETE	89
Buffalo_SOX-2	MYNMMETELKPPGQQTSGGGGGGGG-NSTAAAAGGNQKNSPDRVKRPMNAFMVWSRGQRRKMAQENPKMHNSEISKRLGAEWKLLSETE	90
Goat_SOX-2	MYNMMETELEQPGQHNSGGGGGGGG-NSTAAAAGGNQKNSPDRVKRPMNAFMVWSRGQRRKMAQENPKMHNSEISKRLGAEWKLLSETE	89
Sheep_SOX-2	MYNMMETELKPPGQQTSGGGGGGGG-NSTAAAAGGNQKNSPDRVKRPMNAFMVWSRGQRRKMAQENPKMHNSEISKRLGAEWKLLSETE	89
Cow_SOX-2	KRPFIDEAKRLRALHMKHEPDYKYRPRRKTTLTKKDKYTLPGGLLAPGGNSMASGCVGVGAGLGAGVNRMDSYAHMNGWSNGSYSMMD	179
Buffalo_SOX-2	KRPFIDEAKRLRALHMKHEPDYKYRPRRKTTLTKKDKYTLPGGLLAPGGNSMASGCVGVGAGLGAGVNRMDSYAHMNGWSNGSYSMMD	180
Goat_SOX-2	KRPFIDEAKRLRALHMKHEPDYKYRPRRKTTLTKKDKYTLPGGLLAPGGNSMASGCVGVGAGLGAGVNRMDSYAHMNGWSNGSYSMMD	179
Sheep_SOX-2	KRPFIDEAKRLRALHMKHEPDYKYRPRRKTTLTKKDKYTLPGGLLAPGGNSMASGCVGVGAGLGAGVNRMDSYAHMNGWSNGSYSMMD	179
Cow_SOX-2	QLGYPQHPGLNAHGAAQMPMHRYDVSALQYNSMTSSQTYMNGSPTYMSYSQQGTPGMALGSMGVSVKSEASSPPVVTSSSHSRAPCQ	269
Buffalo_SOX-2	QLGYPQHPGLNAHGAAQMPMHRYDVSALQYNSMTSSQTYMNGSPTYMSYSQQGTPGMALGSMGVSVKSEASSPPVVTSSSHSRAPCQ	270
Goat_SOX-2	QLGYPQHPGLNAHGAAQMPMHRYDVSALQYNSMTSSQTYMNGSPTYMSYSQQGTPGMALGSMGVSVKSEASSPPVVTSSSHSRAPCQ	269
Sheep_SOX-2	QLGYPQHPGLNAHGAAQMPMHRYDVSALQYNSMTSSQTYMNGSPTYMSYSQQGTPGMALGSMGVSVKSEASSPPVVTSSSHSRAPCQ	269
Cow_SOX-2	AGDLRDMISMYLPGAEVPEPAAPSLHMSQHYQSGFVPGTAINGTLPLSHM	320
Buffalo_SOX-2	AGDLRDMISMYLPGAEVPEPAAPSLHMSQHYQSGFVPGTAINGTLPLSHM	321
Goat_SOX-2	AGDLRDMISMYLPGAEVPEPAAPSLHMSQHYQSGFVPGTAINGTLPLSHM	320
Sheep_SOX-2	AGDLRDMISMYLPGAEVPEPAAPSLHMSQHYQSGFVPGTAINGTLPLSHM	320

Figure S2. Comparative amino acid analysis of Sox2 gene in cattle, buffalo, sheep, and goat

Cow_SOX-3	-----MRPARDHASGASSIRGPADLARTTAASLPFFPDPRQRPPSAPPT	45
Buffalo_SOX-3	MIGQGASLQACQSPGLRVARGGPSNPPEGSEQVYKRPGERPTRLRMRPARDHASGASSIRGPADLARTTAASLPFFPDPRQRPPSAPPT	90
Goat_SOX-3	-----MRPARDHASGASSIRGPADLARTTAASLPFFPDPRQRPPSAPPT	45
Sheep_SOX-3	-----MRPARDHASGASSIRGPADLARTTAASLPFFPDPRQRPPSAPPT	45
Cow_SOX-3	ESPGLFTVAAPAPGAPSPPATLAHLLPAPAMYSLLETTELKNPVGPPTPAAGAGGPAAPGGACKSSANAGGGANAGGSSGGASAGGGGGG	135
Buffalo_SOX-3	ESPGLFTVAAPAPGAPSPPATLAHLLPAPAMYSLLETTELKNPVGPPTPAAGAGGPAAPGGACKSSANAGGGANAGGSSGGASAGGGGGG	180
Goat_SOX-3	ESPGLFTVAAPAPGAPSPPATLAHLLPAPAMYSLLETTELKNPVGPPTPAAGAGGPAAPGGACKSSANAGGGANAGGSSGGASAGGGGGG	135
Sheep_SOX-3	ESPGLFTVAAPAPGAPSPPATLAHLLPAPAMYSLLETTELKNPVGPPTPAAGAGGPAAPGGACKSSANAGGGANAGGSSGGASAGGGGGG	135
Cow_SOX-3	GGGGGGSDQDRVKRPMNAFMVWSRGQRRKMALENPKMHNSEISKRLGADWKLLTDAEKRPFIDEAKRLRAVHMKEYPDYKYRPRRKT	224
Buffalo_SOX-3	GGGGGGSDQDRVKRPMNAFMVWSRGQRRKMALENPKMHNSEISKRLGADWKLLTDAEKRPFIDEAKRLRAVHMKEYPDYKYRPRRKT	270
Goat_SOX-3	GGGGGGSDQDRVKRPMNAFMVWSRGQRRKMALENPKMHNSEISKRLGADWKLLTDAEKRPFIDEAKRLRAVHMKEYPDYKYRPRRKT	224
Sheep_SOX-3	GGGGGGSDQDRVKRPMNAFMVWSRGQRRKMALENPKMHNSEISKRLGADWKLLTDAEKRPFIDEAKRLRAVHMKEYPDYKYRPRRKT	224
Cow_SOX-3	TLLKKDKYSLPGGLLPPGAAAAAAAAAAAAASSPVGVGQRLDTYTHVNGWANGAYSLVQEQQLGYAPPATMSSPPPPALPQMHRVDMAG	314
Buffalo_SOX-3	TLLKKDKYSLPGGLLPPGAAAAAAAAAAAAASSPVGVGQRLDTYTHVNGWANGAYSLVQEQQLGYAPPATMSSPPPPALPQMHRVDMAG	360
Goat_SOX-3	TLLKKDKYSLPGGLLPPGAAAAAAAAAAAAASSPVGVGQRLDTYTHVNGWANGAYSLVQEQQLGYAPPATMSSPPPPALPQMHRVDMAG	314
Sheep_SOX-3	TLLKKDKYSLPGGLLPPGAAAAAAAAAAAAASSPVGVGQRLDTYTHVNGWANGAYSLVQEQQLGYAPPATMSSPPPPALPQMHRVDMAG	314
Cow_SOX-3	LQYSPMMPPGAQSYMNAASGYGSMAPSAAYGQQPAAAAAAAMSLGPMGTVVKTEPSSPPPAIASHSQRACLGDLRD	404
Buffalo_SOX-3	LQYSPMMPPGAQSYMNAASGYGSMAPSAAYGQQPAAAAAAAMSLGPMGTVVKTEPSSPPPAIASHSQRACLGDLRD	450
Goat_SOX-3	LQYSPMMPPGAQSYMNAASGYGSMAPSAAYGQQPAAAAAAAMSLGPMGTVVKTEPSSPPPAIASHSQRACLGDLRD	404
Sheep_SOX-3	LQYSPMMPPGAQSYMNAASGYGSMAPSAAYGQQPAAAAAAAMSLGPMGTVVKTEPSSPPPAIASHSQRACLGDLRD	404
Cow_SOX-3	MISMYLPPGGDAADAASPLPGRRLHSVHQHYQGAGTAVNGTVPLTHI	451
Buffalo_SOX-3	MISMYLPPGGDAADAASPLPGRRLHSVHQHYQGAGTAVNGTVPLTHI	497
Goat_SOX-3	MISMYLPPGGDAADAASPLPGRRLHSVHQHYQGAGTAVNGTVPLTHI	451
Sheep_SOX-3	MISMYLPPGGDAADAASPLPGRRLHSVHQHYQGAGTAVNGTVPLTHI	451

Figure S3. Comparative amino acid analysis of Sox3 gene in cattle, buffalo, sheep, and goat

Cow_SOX-4	MVQQTNNAENTEALLAGESSDSGAGLELGIASSPTPGSTASTGGKADDP	PSGHIKRP	NAFMVWSQIERRKIMEQSPDMHNAEIS	90
Buffalo_SOX-4	MVQQTNNAENTEALLAGESSDSGAGLELGIASSPTPGSTASTGGKADDP	PSGHIKRP	NAFMVWSQIERRKIMEQSPDMHNAEIS	90
Goat_SOX-4	MVQQTNNAENTEALLAGESSDSGAGLELGIASSPTPGSTASTGGKADDP	PSGHIKRP	NAFMVWSQIERRKIMEQSPDMHNAEIS	90
Sheep_SOX-4	MVQQTNNAENTEALLAGESSDSGAGLELGIASSPTPGSTASTGGKADDP	PSGHIKRP	NAFMVWSQIERRKIMEQSPDMHNAEIS	90
Cow_SOX-4	KRLGKRWKLKDSKIPFIREAERLRLKHMADYPDYKYRPRKKVKSGNANS	GSAAAAASKPGEKGD	KVGGSGHGGGGGGSHAGGGGGG	180
Buffalo_SOX-4	KRLGKRWKLKDSKIPFIREAERLRLKHMADYPDYKYRPRKKVKSGNANS	GSAAAAASKPGEKGD	KVGGSGHGGGGGGSHAGGGGGG	180
Goat_SOX-4	KRLGKRWKLKDSKIPFIREAERLRLKHMADYPDYKYRPRKKVKSGNANS	GSAAAAASKPGEKGD	KVGGSGHGGGGGGSHAGGGGGG	180
Sheep_SOX-4	KRLGKRWKLKDSKIPFIREAERLRLKHMADYPDYKYRPRKKVKSGNANS	GSAAAAASKPGEKGD	KVGGSGHGGGGGGSHAGGGGGG	180
Cow_SOX-4	ASGGGANSKPAQKKSCGSKVAGGGVGKPHAKLILAGGGGKAAAAT	ASASSSSSSSS--FAAEQAGAAALLP	GAAAAAADHHSLYKARTP	268
Buffalo_SOX-4	ASGGGANSKPAQKKSCGSKVAGGGVGKPHAKLILAGGGGKAAAAT	ASASSSSSSSS--FAAEQAGAAALLP	GAAAAAADHHSLYKARTP	268
Goat_SOX-4	ASGGGANSKPAQKKSCGSKVAGGGVGKPHAKLILAGGGGKAAAAT	ASASSSSSSSS--FAAEQAGAAALLP	GAAAAAADHHSLYKARTP	270
Sheep_SOX-4	ASGGGANSKPAQKKSCGSKVAGGGVGKPHAKLILAGGGGKAAAAT	ASASSSSSSSS--FAAEQAGAAALLP	GAAAAAADHHSLYKARTP	270
Cow_SOX-4	--GASASAAAASASAGLAAPGKHDAEKKVKRVYLF	FGGLGASSSPVGGV	GAGADPSDPLGLYEEGGAGCSPDGP	356
Buffalo_SOX-4	--GASASAAAASASAGLAAPGKHDAEKKVKRVYLF	FGGLGASSSPVGGV	GAGADPSDPLGLYEEGGAGCSPDGP	356
Goat_SOX-4	SASASASAAAASASAGLAAPGKHDAEKKVKRVYLF	FGGLGASSSPVGGV	GAGADPSDPLGLYEEGGAGCSPDGP	360
Sheep_SOX-4	SASASASAAAASASAGLAAPGKHDAEKKVKRVYLF	FGGLGASSSPVGGV	GAGADPSDPLGLYEEGGAGCSPDGP	360
Cow_SOX-4	ADHRSYASLRAASPAPSSAPSHASSSASSSSSSSSSSSSSSSSSS	SSSSSDDEFEDDLLD	LNPNSSNFESMSLGSFSSSSALDRDLDFNFEP	445
Buffalo_SOX-4	ADHRSYASLRAASPAPSSAPSHASSSASSSSSSSSSSSSSSSSSS	SSSSSDDEFEDDLLD	LNPNSSNFESMSLGSFSSSSALDRDLDFNFEP	446
Goat_SOX-4	ADHRSYASLRAASPAPSSAPSHASSSASSSSSSSSSSSSSSSSSS	SSSSSDDEFEDDLLD	LNPNSSNFESMSLGSFSSSSALDRDLDFNFEP	449
Sheep_SOX-4	ADHRSYASLRAASPAPSSAPSHASSSASSSSSSSSSSSSSSSSSS	SSSSSDDEFEDDLLD	LNPNSSNFESMSLGSFSSSSALDRDLDFNFEP	449
Cow_SOX-4	GS	SGSHFEFPDYCTPEVSEMI	SGDWLESSISNLVFTY	481
Buffalo_SOX-4	GS	SGSHFEFPDYCTPEVSEMI	SGDWLESSISNLVFTY	482
Goat_SOX-4	GS	SGSHFEFPDYCTPEVSEMI	SGDWLESSISNLVFTY	485
Sheep_SOX-4	GS	SGSHFEFPDYCTPEVSEMI	SGDWLESSISNLVFTY	485

Figure S4. Comparative amino acid analysis of Sox4 gene in cattle, buffalo, sheep, and goat

Cow_SOX-5	MLTDPDLPQEFERMSSKRPASPYGEADGEVAMVTSRQKVEEESDGLPAFHLPLHVSFPNKPHEEFQPVSLLTQETCGHRTPTASQHNTM	90
Buffalo_SOX-5	MLTDPDLPQEFERMSSKRPASPYGEADGEVAMVTSRQKVEEESDGLPAFHLPLHVSFPNKPHEEFQPVSLLTQETCGHRTPTASQHNTM	90
Goat_SOX-5	MLTDPDLPQEFERMSSKRPASPYGEADGEVAMVTSRQKVEEESDGLPAFHLPLHVSFPNKPHEEFQPVSLLTQETCGHRTPTASQHNTM	90
Sheep_SOX-5	MLTDPDLPQEFERMSSKRPASPYGEADGEVAMVTSRQKVEEESDGLPAFHLPLHVSFPNKPHEEFQPVSLLTQETCGHRTPTASQHNTM	90
Cow_SOX-5	EVDGNKMSSSFAPHNSSTSPQKAEEGGRQSGESLSSTTLGTPERRKGLADVVDTLKQRKMEELIKNEPEETPSIEKLLSKDWKDKLLAM	180
Buffalo_SOX-5	EVDGNKMSSSFAPHNSSTSPQKAEEGGRQSGESLSSTTLGTPERRKGLADVVDTLKQRKMEELIKNEPEETPSIEKLLSKDWKDKLLAM	180
Goat_SOX-5	EVDGNKMSSSFAPHNSSTSPQKAEEGGRQSGESLSSTTLGTPERRKGLADVVDTLKQRKMEELIKNEPEETPSIEKLLSKDWKDKLLAM	180
Sheep_SOX-5	EVDGNKMSSSFAPHNSSTSPQKAEEGGRQSGESLSSTTLGTPERRKGLADVVDTLKQRKMEELIKNEPEETPSIEKLLSKDWKDKLLAM	180
Cow_SOX-5	GSGNFGEIKGTPESLAEKERQLMGINQLTSLREQLLAAHDEQKKLAASQIEKQRQQMELARQQQEQTARQQQQLLQQQHKNLLQQQIQ	270
Buffalo_SOX-5	GSGNFGEIKGTPESLAEKERQLMGINQLTSLREQLLAAHDEQKKLAASQIEKQRQQMELARQQQEQTARQQQQLLQQQHKNLLQQQIQ	270
Goat_SOX-5	GSGNFGEIKGTPESLAEKERQLMGINQLTSLREQLLAAHDEQKKLAASQIEKQRQQMELARQQQEQTARQQQQLLQQQHKNLLQQQIQ	270
Sheep_SOX-5	GSGNFGEIKGTPESLAEKERQLMGINQLTSLREQLLAAHDEQKKLAASQIEKQRQQMELARQQQEQTARQQQQLLQQQHKNLLQQQIQ	270
Cow_SOX-5	QVQGQLPPLMIPVFPPDQRTLAAAQQGFLPPGFSYKAGCSDPYPVQLIPTTMAAAAAATPGLGPLQLQQLYAAQLAAMQVSPGGKLP	360
Buffalo_SOX-5	QVQGQLPPLMIPVFPPDQRTLAAAQQGFLPPGFSYKAGCSDPYPVQLIPTTMAAAAAATPGLGPLQLQQLYAAQLAAMQVSPGGKLP	360
Goat_SOX-5	QVQGQLPPLMIPVFPPDQRTLAAAQQGFLPPGFSYKAGCSDPYPVQLIPTTMAAAAAATPGLGPLQLQQLYAAQLAAMQVSPGGKLP	359
Sheep_SOX-5	QVQGQLPPLMIPVFPPDQRTLAAAQQGFLPPGFSYKAGCSDPYPVQLIPTTMAAAAAATPGLGPLQLQQLYAAQLAAMQVSPGGKLP	360
Cow_SOX-5	VSQGNLGAAVSPTSISHTDKSTNSPPPKSKDEVAQPLNLSAKPKTSDGKSPTSPTSPHMPALRINSAGAGPLKASVPASLASPSARVSTIGY	450
Buffalo_SOX-5	VSQGNLGAAVSPTSISHTDKSTNSPPPKSKDEVAQPLNLSAKPKTSDGKSPTSPTSPHMPALRINSAGAGPLKASVPASLASPSARVSTIGY	450
Goat_SOX-5	VSQGNLGAAVSPTSISHTDKSTNSPPPKSKDEVAQPLNLSAKPKTSDGKSPTSPTSPHMPALRINSAGAGPLKASVPASLASPSARVSTIGY	449
Sheep_SOX-5	VSQGNLGAAVSPTSISHTDKSTNSPPPKSKDEVAQPLNLSAKPKTSDGKSPTSPTSPHMPALRINSAGAGPLKASVPASLASPSARVSTIGY	450
Cow_SOX-5	LNDHDAVTKAIQEARQMKEQLRREQQVLDGKVAVVNSLGLNCRTEKEKTTLESITQQLAVKQNEEGKFSHAMMDFNMSGSDSGSAGVSE	540
Buffalo_SOX-5	LNDHDAVTKAIQEARQMKEQLRREQQVLDGKVAVVNSLGLNCRTEKEKTTLESITQQLAVKQNEEGKFSHAMMDFNMSGSDSGSAGVSE	540
Goat_SOX-5	LNDHDAVTKAIQEARQMKEQLRREQQVLDGKVAVVNSLGLNCRTEKEKTTLESITQQLAVKQNEEGKFSHAMMDFNMSGSDSGSAGVSE	539
Sheep_SOX-5	LNDHDAVTKAIQEARQMKEQLRREQQVLDGKVAVVNSLGLNCRTEKEKTTLESITQQLAVKQNEEGKFSHAMMDFNMSGSDSGSAGVSE	540
Cow_SOX-5	SRIYRESRGRGSNEPHIKRPMNAFMVWAKDERRKILQAFPMHNSNISKILGSRWKAMTNLEKQPYEEQARLSKQHLEKYPDYKYKRP	630
Buffalo_SOX-5	SRIYRESRGRGSNEPHIKRPMNAFMVWAKDERRKILQAFPMHNSNISKILGSRWKAMTNLEKQPYEEQARLSKQHLEKYPDYKYKRP	630
Goat_SOX-5	SRIYRESRGRGSNEPHIKRPMNAFMVWAKDERRKILQAFPMHNSNISKILGSRWKAMTNLEKQPYEEQARLSKQHLEKYPDYKYKRP	629
Sheep_SOX-5	SRIYRESRGRGSNEPHIKRPMNAFMVWAKDERRKILQAFPMHNSNISKILGSRWKAMTNLEKQPYEEQARLSKQHLEKYPDYKYKRP	630
Cow_SOX-5	KRTCLVDGKKLRIGEYKAIMRNRQEMRQYFNVGQQAQIPIATAGVVYPGAIAMAGMPSPHLPSEHSSVSSSPGMPVIQSTYGVKGEE	720
Buffalo_SOX-5	KRTCLVDGKKLRIGEYKAIMRNRQEMRQYFNVGQQAQIPIATAGVVYPGAIAMAGMPSPHLPSEHSSVSSSPGMPVIQSTYGVKGEE	720
Goat_SOX-5	KRTCLVDGKKLRIGEYKAIMRNRQEMRQYFNVGQQAQIPIATAGVVYPGAIAMAGMPSPHLPSEHSSVSSSPGMPVIQSTYGVKGEE	719
Sheep_SOX-5	KRTCLVDGKKLRIGEYKAIMRNRQEMRQYFNVGQQAQIPIATAGVVYPGAIAMAGMPSPHLPSEHSSVSSSPGMPVIQSTYGVKGEE	720
Cow_SOX-5	PHIKEEIQAEDINGEIIYDEYDEEEDDPDVDYGSSENHIAGQAN	764
Buffalo_SOX-5	PHIKEEIQAEDINGEIIYDEYDEEEDDPDVDYGSSENHIAGQAN	764
Goat_SOX-5	PHIKEEIQAEDINGEIIYDEYDEEEDDPDVDYGSSENHIAGQAN	763
Sheep_SOX-5	PHIKEEIQAEDINGEIIYDEYDEEEDDPDVDYGSSENHIAGQAN	764

Figure S5. Comparative amino acid analysis of Sox5 gene in cattle, buffalo, sheep, and goat

Cow_SoX-6	-MLSSSEVLADVVRESRIEENKKS--SHFIRMSSKQATSPFACTADGEEAMTQDLTSREKEEGSDQHVASHLPLHPIMHNKPHSEELPTLV	87
Buffalo_SoX-6	-MPSSSEVLADVVRESRIEENKKS--SHFIRMSSKQATSPFACTADGEDAMTQDLTSREKEEGSDQHVASHLPLHPIMHNKPHSEELPTLV	87
Goat_SoX-6	MYLFFSELICICLHVRRQKTWADMYSTDTRMSSKQATSPFACTADGEEAMTQDLTSREKEEGSDQHVASHLPLHPIMHNKPHSEELPTLV	90
Sheep_SoX-6	-MPSSSEVLADVVRESRIEENKKS--SHFIRMSSKQATSPFACTADGEEAMTQDLTSREKEEGSDQHVASHLPLHPIMHNKPHSEELPTLV	87
Cow_SoX-6	NTIQDADWDVSLSSQQRMESENNKLCSLYSFRNTSTSPHKPDEGSRDREMTSVTFGTPERRKGLADVVDTLKQKKLEEMTRTEQEDS	177
Buffalo_SoX-6	NTIQDADWDVSLSSQQRMESENNKLCSLYSFRNTSTSPHKPDEGSRDREMTSVTFGTPERRKGLADVVDTLKQKKLEEMTRTEQEDS	177
Goat_SoX-6	NTIQDADWDVSLSSQQRMESENNKLCSLYSFRNTSTSPHKPDEGSRDREMTSVTFGTPERRKGLADVVDTLKQKKLEEMTRTEQEDS	180
Sheep_SoX-6	NTIQDADWDVSLSSQQRMESENNKLCSLYSFRNTSTSPHKPDEGSRDREMTSVTFGTPERRKGLADVVDTLKQKKLEEMTRTEQEDS	177
Cow_SoX-6	SCMEKLLSKDNKEKMERLNTSELLGEIKGTPESLAEKERQLSTMITQLISLREQLLAHDEQKKLAASQIEKQRQQMDLARQQEQIARQ	267
Buffalo_SoX-6	SCMEKLLSKDNKEKMERLNTSELLGEIKGTPESLAEKERQLSTMITQLISLREQLLAHDEQKKLAASQIEKQRQQMDLARQQEQIARQ	267
Goat_SoX-6	SCMEKLLSKDNKEKMERLNTSELLGEIKGTPESLAEKERQLSTMITQLISLREQLLAHDEQKKLAASQIEKQRQQMDLARQQEQIARQ	270
Sheep_SoX-6	SCMEKLLSKDNKEKMERLNTSELLGEIKGTPESLAEKERQLSTMITQLISLREQLLAHDEQKKLAASQIEKQRQQMDLARQQEQIARQ	267
Cow_SoX-6	QQQLLQQQHKNINLLQQQIQ-VQGHMPLMIPFPHDQRTLAAAAAAQQGFLFPPGITYKPGDNYPVQFIPSTMAAAAASGLSPLQLQKGH	356
Buffalo_SoX-6	QQQLLQQQHKNINLLQQQIQ-VQGHMPLMIPFPHDQRTLAAAAAAQQGFLFPPGITYKPGDNYPVQFIPSTMAAAAASGLSPLQLQKGH	357
Goat_SoX-6	QQQLLQQQHKNINLLQQQIQ-VQGHMPLMIPFPHDQRTLAAAAAAQQGFLFPPGITYKPGDNYPVQFIPSTMAAAAASGLSPLQLQKGH	359
Sheep_SoX-6	QQQLLQQQHKNINLLQQQIQ-VQGHMPLMIPFPHDQRTLAAAAAAQQGFLFPPGITYKPGDNYPVQFIPSTMAAAAASGLSPLQLQKGH	357
Cow_SoX-6	VSHPQINPRLKGLSDRLGRSLDTFEHGGGHSYNHKEIQEQLYAAQLASMQVSPGAKMPSTPQPPNAGAVSPTGIKNEKRGTSPTVQVKDE	446
Buffalo_SoX-6	VSHPQINPRLKGLSDRLGRSLDTFEHGGGHSYNHKEIQEQLYAAQLASMQVSPGAKMPSTPQPPNAGAVSPTGIKNEKRGTSPTVQVKDE	447
Goat_SoX-6	VSHPQINPRLKGLSDRLGRSLDTFEHGGGHSYNHKEIQEQLYAAQLASMQVSPGAKMPSTPQPPNAGAVSPTGIKNEKRGTSPTVQVKDE	449
Sheep_SoX-6	VSHPQINPRLKGLSDRLGRSLDTFEHGGGHSYNHKEIQEQLYAAQLASMQVSPGAKMPSTPQPPNAGAVSPTGIKNEKRGTSPTVQVKDE	447
Cow_SoX-6	AAAQPLNLSSRPKTVPEPVKSPTSPTQSLEPASKTSPVNLPNKSSIPSPIGGSLGRGSSLGKWKSSHQEETVELDILSSINSALFGDQDT	536
Buffalo_SoX-6	AAAQPLNLSSRPKTVPEPVKSPTSPTQSLEPASKTSPVNLPNKSSIPSPIGGSLGRGSSLGKWKSSHQEETVELDILSSINSALFGDQDT	537
Goat_SoX-6	AAAQPLNLSSRPKTVPEPVKSPTSPTQSLEPASKTSPVNLPNKSSIPSPIGGSLGRGSSLGKWKSSHQEETVELDILSSINSALFGDQDT	539
Sheep_SoX-6	AAAQPLNLSSRPKTVPEPVKSPTSPTQSLEPASKTSPVNLPNKSSIPSPIGGSLGRGSSLGKWKSSHQEETVELDILSSINSALFGDQDT	537
Cow_SoX-6	VMKAIQEARMKREIQIREQQQQQPHGVGDKLSTLNNMGLNCRNEKERTRFENLGPQLTGKSSSEDGKLGPGVIDLTRPDAEGSKAMNGS	626
Buffalo_SoX-6	VMKAIQEARMKREIQIREQQQQQPHGVGDKLSTLNNMGLNCRNEKERTRFENLGPQLTGKSSSEDGKLGPGVIDLTRPDAEGSKAMNGS	627
Goat_SoX-6	VMKAIQEARMKREIQIREQQQQQPHGVGDKLSTLNNMGLNCRNEKERTRFENLGPQLTGKSSSEDGKLGPGVIDLTRPDAEGSKAMNGS	629
Sheep_SoX-6	VMKAIQEARMKREIQIREQQQQQPHGVGDKLSTLNNMGLNCRNEKERTRFENLGPQLTGKSSSEDGKLGPGVIDLTRPDAEGSKAMNGS	627
Cow_SoX-6	AAKLQYYCWP TGATVAEARVYRDARGRASSEPHIKRPMNAFMVWAKDERRKILQAFDPMHNSNISKILGSRWKSMSNQEKOPYEEQA	716
Buffalo_SoX-6	AAKLQYYCWP TGATVAEARVYRDARGRASSEPHIKRPMNAFMVWAKDERRKILQAFDPMHNSNISKILGSRWKSMSNQEKOPYEEQA	717
Goat_SoX-6	AAKLQYYCWP TGATVAEARVYRDARGRASSEPHIKRPMNAFMVWAKDERRKILQAFDPMHNSNISKILGSRWKSMSNQEKOPYEEQA	719
Sheep_SoX-6	AAKLQYYCWP TGATVAEARVYRDARGRASSEPHIKRPMNAFMVWAKDERRKILQAFDPMHNSNISKILGSRWKSMSNQEKOPYEEQA	717
Cow_SoX-6	RLSKIHLEKYPNYKYKPRPKRTCIVDGKKLRIGEYKQLMRSRRQEMRQFFTVGQQPQIPITTTGTGVVYPGAITMATTTTSPQMTSDCSST	806
Buffalo_SoX-6	RLSKIHLEKYPNYKYKPRPKRTCIVDGKKLRIGEYKQLMRSRRQEMRQFFTVGQQPQIPITTTGTGVVYPGAITMATTTTSPQMTSDCSST	807
Goat_SoX-6	RLSKIHLEKYPNYKYKPRPKRTCIVDGKKLRIGEYKQLMRSRRQEMRQFFTVGQQPQIPITTTGTGVVYPGAITMATTTTSPQMTSDCSST	809
Sheep_SoX-6	RLSKIHLEKYPNYKYKPRPKRTCIVDGKKLRIGEYKQLMRSRRQEMRQFFTVGQQPQIPITTTGTGVVYPGAITMATTTTSPQMTSDCSST	807
Cow_SoX-6	SASPEPSLPVIQSSYGMKTDGGSLAGNEMINGEDEMEMYDDYEDDPKSDYSSSENAEPAVSAN	869
Buffalo_SoX-6	SASPEPSLPVIQSSYGMKTDGGSLAGNEMINGEDEMEMYDDYEDDPKSDYSSSENAEPAVSAN	870
Goat_SoX-6	SASPEPSLPVIQSSYGMKTDGGSLAGNEMINGEDEMEMYDDYEDDPKSDYSSSENAEPAVSAN	872
Sheep_SoX-6	SASPEPSLPVIQSSYGMKTDGGSLAGNEMINGEDEMEMYDDYEDDPKSDYSSSENAEPAVSAN	870

Figure S6. Comparative amino acid analysis of Sox6 gene in cattle, buffalo, sheep, and goat

Cow_SoX-7	-----	0
Buffalo_SoX-7	MRGWSPAPAPGPRDHRRLLPPGRRHLRCELAGRGAAPGLRGTDPREPPGRRRGPGAGARWGSGPPPASPPGRSERGRCGPGRREGARAV	90
Goat_SoX-7	-----	0
Sheep_SoX-7	-----	0
Cow_SoX-7	-----MASLLGTYPWPEGLECPALEAELSDGLSPPAAP	33
Buffalo_SoX-7	KEGGAAPPSPRVIGGRSLSKLINKGPGRCRPSWTPQPVRGPGQRPPDDAKRGDPRAAMASLLGTYPWPEGLECPALEAELSDGLSPPAAP	180
Goat_SoX-7	-----MASLLGTYPWPEGLECPALEAELSDGLSPPAAP	33
Sheep_SoX-7	-----MASLLGTYPWPEGLECPALEAELSDGLSPPAAP	33
Cow_SoX-7	RPPGDKGSESRIRRPMNAFMVWAKDERKRLAVQNPDLNHAELSKMLGKSWKALTLSQKRPHYVDEAERLRLQHMQDYPNYKYRPRRKKQAK	123
Buffalo_SoX-7	RPPGDKGSESRIRRPMNAFMVWAKDERKRLAVQNPDLNHAELSKMLGKSWKALTLSQKRPHYVDEAERLRLQHMQDYPNYKYRPRRKKQAK	270
Goat_SoX-7	RPPGDKGSESRIRRPMNAFMVWAKDERKRLAVQNPDLNHAELSKMLGKSWKALTLSQKRPHYVDEAERLRLQHMQDYPNYKYRPRRKKQAK	123
Sheep_SoX-7	RPPGDKGSESRIRRPMNAFMVWAKDERKRLAVQNPDLNHAELSKMLGKSWKALTLSQKRPHYVDEAERLRLQHMQDYPNYKYRPRRKKQAK	123
Cow_SoX-7	RLCKRVDPGFLLSSLSRDQNSLPEKRGGGRGAPGEKEDRGEYSPSALPGLRGCFHDGPAGGSGGGGTGGSVDAYPYGLPTPPEMSPLD	212
Buffalo_SoX-7	RLCKRVDPGFLLSSLSRDQNSLPEKRGGGRGAPGEKEDRGEYSPSALPGLRGCFHDGPAGGSGGGGTGGSVDAYPYGLPTPPEMSPLD	359
Goat_SoX-7	RLCKRVDPGFLLSSLSRDQNSLPEKRGGGRGAPGEKEDRGEYSPSALPGLRGCFHDGPAGGSGGGGTGGSVDAYPYGLPTPPEMSPLD	212
Sheep_SoX-7	RLCKRVDPGFLLSSLSRDQNSLPEKRGGGRGAPGEKEDRGEYSPSALPSLRGCFHDGPAGGSGGGGTGGSVDAYPYGLPTPPEMSPLD	213
Cow_SoX-7	VLEPEQTFSSPCQEDHAHSRRIAHLPGPPYSPEYAPNPLHCGHPLGSLALQSSGSVMSTVPGCPPSPAYYSQAAYPPLHSLNLAHLG	302
Buffalo_SoX-7	VLEPEQTFSSPCQEDHAHSRRIAHLPGPPYSPEYAPNPLHCGHPLGSLALQSSGSVMSTVSGCPPSPAYYSQAAYPPLHSLNLAHLG	449
Goat_SoX-7	VLEPEQTFSSPCQEDHAHSRRIAHLPGPPYSPEYAPNPLHCGHPLGSLALQSSGSVMSTVPGCPPSPAYYSQAAYPPLHSLNLAHLG	302
Sheep_SoX-7	VLEPEQTFSSPCQEDRAHSRRVAHLPGPPYSPEYAPNPLHCGHPLGSLALQSSGSVMSTVPGCPPSPAYYSQAAYPPLSLNLAHLG	303
Cow_SoX-7	QLSPPEHPGFEALDQLSQVELLGMDRNEFDQYLNTPGHPDSSAAGALSAQGAVSQVTPGTGPTETSLISVLADATATYYNSYSVS	387
Buffalo_SoX-7	QLSPPEHPGFEALDQLSQVELLGMDRNEFDQYLNTPGHPDSSAAGALSGQGAVSQVTPGTGPTETSLISVLADATATYYNSYSVS	534
Goat_SoX-7	QLSPPEHPGFDALDQLSQVELLGMDRNEFDQYLNTPGHPDSS--GALSGQGAVSQVTPGTGPTETSLISVLADATATYYNSYSVS	385
Sheep_SoX-7	QLSPPEHPGFDALDQLSQVELLGMDRNEFDQYLNTPGHPDSS--GALSGQGAVSQVTPGTGPTETSLISVLADATATYYNSYSVS	386

Figure S7. Comparative amino acid analysis of Sox7 gene in cattle, buffalo, sheep, and goat

Cow_SOX-8	MGSRTGGALWQPLKETCCGSPRGDRSPAAAAVSGLGSGHRTATSGPRAAAQRPSTRCASLVRASPRAAFM	LDMSEARAQPPCSPSGT	90
Buffalo_SOX-8	MGSRTGGALWQPLKETCCGSPRGDRSPAAAAVSGLGSGHHAATSGPRAAAQRPSTRCASLVRASPRAAFM	LDMSEARAQPPCSPSGT	90
Goat_SOX-8	MGSRAEGGALWPLLKETCCGSPRGDPSAAAAVSGLGSGHCTATSDPRAAAQRPSTRCASLVRASPRAAFM	LDMSEARAQPPCSPSGT	90
Sheep_SOX-8	-----	LDMSEARAQPPCSPSGT	18
Cow_SOX-8	ASSMSHVEDSDSDAPPSPA	GSEGLGRAAGAGGGGRGDAEEAADERFPACIRDAVSQVLKGYDWSLVPMPVRGGGGGALKAKPHVKRPMNA	180
Buffalo_SOX-8	ASSMSHVEDSDSDAPPSPA	GSEGLGRAAGAGGGGRGDAEEAADERFPACIRDAVSQVLKGYDWSLVPMPVRGGGGGALKAKPHVKRPMNA	180
Goat_SOX-8	ASSMSHVEDSDSDAPPSPT	GSEGLGRAAGAGGGGRGDAEEAADERFPACIRDAVSQVLKGYDWSLVPMPVRGGGGGALKAKPHVKRPMNA	180
Sheep_SOX-8	ASSMSHVEDSDSDAPPSPT	GSEGLGRAAGAGGGGRGDAEEAADERFPACIRDAVSQVLKGYDWSLVPMPVRGGGGGALKAKPHVKRPMNA	108
Cow_SOX-8	FMVWAQAARRKLDQYPHLHNAELSKTLGKLWRLLESEKRPFVEEAERLRVQHKKDHPDYKYQPRRRKSVKTGQSDSDSGAELGHHPGS		270
Buffalo_SOX-8	FMVWAQAARRKLDQYPHLHNAELSKTLGKLWRLLESEKRPFVEEAERLRVQHKKDHPDYKYQPRRRKSVKTGQSDSDSGAELGHHPGG		270
Goat_SOX-8	FMVWAQAARRKLDQYPHLHNAELSKTLGKLWRLLESEKRPFVEEAERLRVQHKKDHPDYKYQPRRRKSVKTGQSDSDSGAELGHHPGG		270
Sheep_SOX-8	FMVWAQAARRKLDQYPHLHNAELSKTLGKLWRLLESEKRPFVEEAERLRVQHKKDHPDYKYQPRRRKSVKTGQSDSDSGAELGHHPGG		198
Cow_SOX-8	MYKTDAGLGDAHHHS	DHTGQTHGPPTPPTTPKTDLHHGGKQELKLEGRRLVDSGRQNIDFSNVDISELSSEVIGNMDTFDVHEFDQYLPL	360
Buffalo_SOX-8	MYKTDAGLGDAHHHS	DHTGQTHGPPTPPTTPKTDLHHGGKQELKLEGRRLVDSGRQNIDFSNVDISELSSEVIGNMDTFDVHEFDQYLPL	360
Goat_SOX-8	VYKTDAGLGDAHHHN	DHTGQTHGPPTPPTTPKTDLHHGGKQELKLEGRRLVDSGRQNIDFSNVDISELSSEVIGNMDTFDVHEFDQYLPL	360
Sheep_SOX-8	VYKTDAGLGDAHHHS	DHTGQTHGPPTPPTTPKTDLHHGGKQELKLEGRRLVDSGRQNIDFSNVDISELSSEVIGNMDTFDVHEFDQYLPL	288
Cow_SOX-8	NGHSALPAEPGPAAAGSYGGT	SYSHSGAASIGASPVWAHKGTSPASASPTAGPPRPHIKTEQLSPGHYGDQSHGSPGHADYGSYSAQA	450
Buffalo_SOX-8	NGHSALPAEPGPAAAGSYGGA	SYSHSGAAGIGASPVWAHKGTSPASASPTAGPPRPHIKTEQLSPGHYGDQSHGSPGHADFGSYSAQA	450
Goat_SOX-8	NGHSALPAEPGPAAAGSYGGA	SYSHSGAASIGASPVWAHKGTSPASASPTAGPPRPHIKTEQLSPGHYGDQSHGSPGHADYGSYSAQA	450
Sheep_SOX-8	NGHSALPAEPGPAAAGSYGGA	SYSHSGAASIGASPVWAHKGTSPASASPTAGPPRPHIKTEQLSPGHYGDQSHGSPGHSDYGSYSAQA	378
Cow_SOX-8	SVTTAAPAAAASSFTSSQCDYTDLQAPSYYGPFPGYPGSLYQYPYFHSRRPYASPLLGGLSVPPAHSPPSNWEQPVYTTLTRP		534
Buffalo_SOX-8	SVTTAAPAAAASSFTSSQCDYTDLQAPSYYGPFPGYPGSLYQYPYFHSRRPYASPLLGGLSVPPAHSPPSNWEQPVYTTLTRP		534
Goat_SOX-8	SVTTAAPAAAASSFTSSQCDYTDLQAPSYYGPFPGYPGSLYQYPYFHSRRPYASPLLGGLSVPPAHSPPSNWEQPVYTTLTRP		534
Sheep_SOX-8	SVTTAAPAAAASSFTSSQCDYTDLQAPGYYSPPFPGYPGSLYQYPYFHSRRPYASPLLGGLSVPPAHSPPSNWEQPVYTTLTRP		462

Figure S8. Comparative amino acid analysis of Sox8 gene in cattle, buffalo, sheep, and goat

Cow_SOX-9	MNLLDPFVKMTDEQEKGLSAAPSPMTSEDSAGSPSPSGSGSDTENTRPQENTFPKGEPLKKSEEDKFPVCIREAVSQVLKGYDWTLPV	90	
Buffalo_SOX-9	MNLLDPFVKMTDEQEKGLSAAPSPMTSEDSAGSPSPSGSGSDTENTRPQENTFPKGEPLKKSEEDKFPVCIREAVSQVLKGYDWTLPV	90	
Goat_SOX-9	MNLLDPFVKMTDEQEKGLSAAPSPMTSEDSAGSPSPSGSGSDTENTRPQENTFPKGEPLKKSEEDKFPVCIREAVSQVLKGYDWTLPV	90	
Sheep_SOX-9	MNLLDPFVKMTDEQEKGLSAAPSPMTSEDSAGSPSPSGSGSDTENTRPQENTFPKGEPLKKSEEDKFPVCIREAVSQVLKGYDWTLPV	90	
Cow_SOX-9	MPVRVNGSSKNKPHVKRPMNAFMVWQAARRKLADQYPHLHNAELSKTLGKLWRLNNESEKRPFFVEEAERLRVQHKKDHPDYKYQPRRRK	180	
Buffalo_SOX-9	MPVRVNGSSKNKPHVKRPMNAFMVWQAARRKLADQYPHLHNAELSKTLGKLWRLNNESEKRPFFVEEAERLRVQHKKDHPDYKYQPRRRK	180	
Goat_SOX-9	MPVRVNGSSKNKPHVKRPMNAFMVWQAARRKLADQYPHLHNAELSKTLGKLWRLNNESEKRPFFVEEAERLRVQHKKDHPDYKYQPRRRK	180	
Sheep_SOX-9	MPVRVNGSSKNKPHVKRPMNAFMVWQAARRKLADQYPHLHNAELSKTLGKLWRLNNESEKRPFFVEEAERLRVQHKKDHPDYKYQPRRRK	180	
Cow_SOX-9	SVKNGQAAEEAPEQTHISPNAIFKALQADSPHSSSGMSEVHSPGEHSGSQSGPPTPPTTPKTDVQPGKADLKREGRPLPEGGRQPPIDF	270	
Buffalo_SOX-9	SVKNGQAAEEAPEQTHISPNAIFKALQADSPHSSSGMSEVHSPGEHSGSQSGPPTPPTTPKTDVQPGKADLKREGRPLPEGGRQPPIDF	270	
Goat_SOX-9	SVKNGQAAEEAPEQTHISPNAIFKALQADSPHSSSGMSEVHSPGEHSGSQSGPPTPPTTPKTDVQPGKADLKREGRPLPEGGRQPPIDF	270	
Sheep_SOX-9	SVKNGQAAEEAPEQTHISPNAIFKALQADSPHSSSGMSEVHSPGEHSGSQSGPPTPPTTPKTDVQPGKADLKREGRPLPEGGRQPPIDF	270	
Cow_SOX-9	RDVDIGELSSDVISNMETFDVHEFDQYLPPNGHPGVPATHGQVITYTGSYGVSSSTAASPAGAGHVWMSKQQAAPPPPPF	360	
Buffalo_SOX-9	RDVDIGELSSDVISNMETFDVHEFDQYLPPNGHPGVPATHGQVITYTGSYGVSSSTAASPAGAGHVWMSKQQAAPPPPPF	360	
Goat_SOX-9	RDVDIGELSSDVISNMETFDVHEFDQYLPPNGHPGVPATHGQVITYTGSYGVSSSTAASPAGAGHVWMSKQQAAPPPPPF	360	
Sheep_SOX-9	RDVDIGELSSDVISNMETFDVHEFDQYLPPNGHPGVPATHGQVITYTGSYGVSSSTAASPAGAGHVWMSKQQAAPPPPPF	359	
Cow_SOX-9	QAPPQPPAPQAPPAAPPQAPPQPPQPPPPPP	AHALGALGSEPGPAQRTHIKTEQLSPSHYSEPPQHSPPQIAYSFPFSLPHYGPSYP	448
Buffalo_SOX-9	QAPPQPPAPQAPPAAPPQAPPQPPQPPPPPP	AHALGALGSEPGPAQRTHIKTEQLSPSHYSEPPQHSPPQIAYSFPFSLPHYGPSYP	449
Goat_SOX-9	QAPPQPPAPQAPPAAPPQAPPQPPQPPPPPP	AHALGALGSEPGPAQRTHIKTEQLSPSHYSEPPQHSPPQIAYSFPFSLPHYGPSYP	449
Sheep_SOX-9	QAPPQPPAPQAPPAAPPQAPPQPPQPPPPPP	AHALGALGSEPGPAQRTHIKTEQLSPSHYSEPPQHSPPQIAYSFPFSLPHYGPSYP	449
Cow_SOX-9	PITRAQYDYN	DPQNSGAYYSHAAGQGSGLYSTFSYMSPAQRPMYTPPIADTSGVPSIPQTHSPQHWEQPVYTQLTRP	524
Buffalo_SOX-9	PITRAQYDYN	DPQNSGAYYSHAAGQGSGLYSTFSYMSPAQRPMYTPPIADTSGVPSIPQTHSPQHWEQPVYTQLTRP	525
Goat_SOX-9	PITRAQYDYS	DPQNSGAYYSHAAGQGSGLYSTFSYMSPAQRPMYTPPIADTSGVPSIPQTHSPQHWEQPVYTQLTRP	525
Sheep_SOX-9	PITRAQYDYS	DPQNSGAYYSHAAGQGSGLYSTFSYMSPAQRPMYTPPIADTSGVPSIPQTHSPQHWEQPVYTQLTRP	525

Figure S9. Comparative amino acid analysis of Sox9 gene in cattle, buffalo, sheep, and goat

Cow_SOX-10	MAEEQDLSEVELSPVGSEEPRLSPGSAPSLGPDGGGGGGGGSGLRASPGPGELGKVKKEQQDGEADDDKFPVCIREAVSQVLSGYDWTL	90
Buffalo_SOX-10	MAEEQDLSEVELSPVGSEEPRLSPGSAPSLGPDGGGGGGGGSGLRASPGPGELGKVKKEQQDGEADDDKFPVCIREAVSQVLSGYDWTL	90
Goat_SOX-10	MAEEQDLSEVELSPVGSEEPRLSPGSAPSLGPDGGGGGGGGSGLRASPGPGELGKVKKEQQDGEADDDKFPVCIREAVSQVLSGYDWTL	90
Sheep_SOX-10	MAEEQDLSEVELSPVGSEEPRLSPGSAPSLGPDGGGGGGGGSGLRASPGPGELGKVKKEQQDGEADDDKFPVCIREAVSQVLSGYDWTL	90
Cow_SOX-10	VPMPVRVNGASKSKPHVKRPMNAFMVWQAARRKLDQYPHLHNAELSKTLGKLWRLNNESEKRPFFIEEAERLRMQHKKHDPDYKYQPRR	180
Buffalo_SOX-10	VPMPVRVNGASKSKPHVKRPMNAFMVWQAARRKLDQYPHLHNAELSKTLGKLWRLNNESEKRPFFIEEAERLRMQHKKHDPDYKYQPRR	180
Goat_SOX-10	VPMPVRVNGASKSKPHVKRPMNAFMVWQAARRKLDQYPHLHNAELSKTLGKLWRLNNESEKRPFFIEEAERLRMQHKKHDPDYKYQPRR	180
Sheep_SOX-10	VPMPVRVNGASKSKPHVKRPMNAFMVWQAARRKLDQYPHLHNAELSKTLGKLWRLNNESEKRPFFIEEAERLRMQHKKHDPDYKYQPRR	180
Cow_SOX-10	RKNGKAAQGESECPGGEAEQGGAAAIQAHYKSAHLDRHHPGEGSPMSDGNPEHPSGQSHGPPTPPTTPKTELQSGKADPKRDGRSLGEGG	270
Buffalo_SOX-10	RKNGKAAQGESECPGGEAEQGGAAAIQAHYKSAHLDRHHPGEGSPMSDGNPEHPSGQSHGPPTPPTTPKTELQSGKADPKRDGRSLGEGG	270
Goat_SOX-10	RKNGKAAQGESECPGGEAEQGGAAAIQAHYKSAHLDRHHPGEGSPMSDGNPEHPSGQSHGPPTPPTTPKTELQSGKADPKRDGRSLGEGG	270
Sheep_SOX-10	RKNGKAAQGESECPGGEAEQGGAAAIQAHYKSAHLDRHHPGEGSPMSDGNPEHPSGQSHGPPTPPTTPKTELQSGKADPKRDGRSLGEGG	270
Cow_SOX-10	KPHIDFGNVDIGEISHEVMSNMETFDVAELDQYLPPNGHPGHVGGYSAAGYGLGSALAVASGHSAWISKPPGVALPTVSPPGVDAKAQVK	360
Buffalo_SOX-10	KPHIDFGNVDIGEISHEVMSNMETFDVAELDQYLPPNGHPGHVGGYSAAGYGLGSALAVASGHSAWISKPPGVALPTVSPPGVDAKAQVK	360
Goat_SOX-10	KPHIDFGNVDIGEISHEVMSNMETFDVAELDQYLPPNGHPGHVGGYSAAGYGLGSALAVASGHSAWISKPPGVALPTVSPPGVDAKAQVK	360
Sheep_SOX-10	KPHIDFGNVDIGEISHEVMSNMETFDVAELDQYLPPNGHPGHVGGYSAAGYGLGSALAVASGHSAWISKPPGVALPTVSPPGVDAKAQVK	360

Cow_SOX-10	TETAGPQGPPHYTDQPSTSQIAYTSLSLPHYGSAPPSISRPFQDYS DHQPSGPYYGHSGQTSGLYSAFSYMGPSQRPLYTAISDPSPSGP	450
Buffalo_SOX-10	TETAGPQGPPHYTDQPSTSQIAYTSLSLPHYGSAPPSISRPFQDYS DHQPSGPYYGHSGQTSGLYSAFSYMGPSQRPLYTAISDPSPSGP	450
Goat_SOX-10	TETAGPQGPPHYTDQPSTSQIAYTSLSLPHYGSAPPSISRPFQDYS DHQPSGPYYGHSGQTSGLYSAFSYMGPSQRPLYTAISDPSPSGP	450
Sheep_SOX-10	TETAGPQGPPHYTDQPSTSQIAYTSLSLPHYGSAPPSISRPFQDYS DHQPSGPYYGHSGQTSGLYSAFSYMGPSQRPLYTAISDPSPSGP	450
Cow_SOX-10	QSHSPTHWEQPVYTTLSRP	469
Buffalo_SOX-10	QSHSPTHWEQPVYTTLSRP	469
Goat_SOX-10	QSHSPTHWEQPVYTTLSRP	469
Sheep_SOX-10	QSHSPTHWEQPVYTTLSRP	469

Figure S10. Comparative amino acid analysis of Sox10 gene in cattle, buffalo, sheep, and goat

Cow_SOX-11	MVQQAESLEAESNLPREALDTEEGEFMACSPVALDES DDPWCKTASGHIKRP MNAFMVWSKIERRKIMEQSPDMHNAEISKRLGKRWKML	90
Buffalo_SOX-11	MVQQAESLEAESNLPREALDTEEGEFMACSPVALDES DDPWCKTASGHIKRP MNAFMVWSKIERRKIMEQSPDMHNAEISKRLGKRWKML	90
Goat_SOX-11	MVQQAESLEAESNLPREALDTEEGEFMACSPVALDES DDPWCKTASGHIKRP MNAFMVWSKIERRKIMEQSPDMHNAEISKRLGKRWKML	90
Sheep_SOX-11	MVQQAESLEAESNLPREALDTEEGEFMACSPVALDES DDPWCKTASGHIKRP MNAFMVWSKIERRKIMEQSPDMHNAEISKRLGKRWKML	90
Cow_SOX-11	KDSEKIPFIREAERLR LKHMADYPDYKYRPRKKPKMDPSAKPSAGOSPEKSAAGGGGG-SAGAGAGGGA KTSKGSSKKCKGLKAPAAPAA	179
Buffalo_SOX-11	KDSEKIPFIREAERLR LKHMADYPDYKYRPRKKPKMDPSAKPSAGOSPEKSAAGGGGG-SAGAGAGGGA KTSKGSSKKCKGLKAPAAPAA	179
Goat_SOX-11	KDSEKIPFIREAERLR LKHMADYPDYKYRPRKKPKMDPSAKPSAGOSPEKSAAGGGGG-SAGAGAGGGA KTSKGSSKKCKGLKAPAAPAA	180
Sheep_SOX-11	KDSEKIPFIREAERLR LKHMADYPDYKYRPRKKPKMDPSAKPSAGOSPEKSAAGGGGG-SAGAGAGGGA KTSKGSSKKCKGLKAPAAPAA	180
Cow_SOX-11	GGAKAGAGKAAQPGDGGGAGDDYVLGSLRVSGAGKTVKCVFLDDDEDEDEDEDELQLRIKQEVDEDDDEPPPHAQLLQPPGQPPPPPLL	269
Buffalo_SOX-11	GGAKAGAGKAAQPGDGGGAGDDYVLGSLRVSGAGKTVKCVFLDDDEDEDEDEDELQLRIKQEVDEDDDEPPPHAQLLQPPGQPPPPPLL	269
Goat_SOX-11	GGAKAGAGKAAQPGDGGGAGDDYVLGSLRVSGAGKTVKCVFLDDDEDEDEDEDELQLRIKQEVDEDDDEPPPHAQLLQPPGQPPPPPLL	270
Sheep_SOX-11	GGAKAGAGKAAQPGDGGGAGDDYVLGSLRVSGAGKTVKCVFLDDDEDEDEDEDELQLRIKQEVDEDDDEPPPHAQLLQPPGQPPPPPLL	270
Cow_SOX-11	RRYSVAKVPASPTLSSAAESPEGASLYDEV RAGAASGAGGGSRLYYSFKNITKQHPPPLAQPALSPASARSVTSSSSSSSSGGGGGGG---	356
Buffalo_SOX-11	RRYSVAKVPASPTLSSAAESPEGASLYDEV RAGAASGAGGGSRLYYSFKNITKQHPPPLAQPALSPASARSVTSSSSSSSSGGGGGGGSS	359
Goat_SOX-11	RRYSVAKVPASPTLSSAAESPEGASLYDEV RAGAASGAGGGSRLYYSFKNITKQHPPPLAQPALSPASARSVTSSSSSSSSGGGGGGGSS	360
Sheep_SOX-11	RRYSVAKVPASPTLSSAAESPEGASLYDEV RAGAASGAGGGSRLYYSFKNITKQHPPPLAQPALSPASARSVTSSSSSSSSGGGGGGGSS	360
Cow_SOX-11	-SSSSSSSGGEDADDLMFDLSLNFSQS AHGAGDQQLGGGAAAGNLSLSLVDKDLDSFEGSLGSHFEFPDYCTPELSEMIAGDWLEANFS	445
Buffalo_SOX-11	-SSSSSSSGGEDADDLMFDLSLNFSQS AHGAGDQQLGGGAAAGNLSLSLVDKDLDSFEGSLGSHFEFPDYCTPELSEMIAGDWLEANFS	449
Goat_SOX-11	-SSSSSSSGGEDADDLMFDLSLNFSQS AHGAGDQQLGGGAAAGNLSLSLVDKDLDSFEGSLGSHFEFPDYCTPELSEMIAGDWLEANFS	449
Sheep_SOX-11	-SSSSSSSGGEDADDLMFDLSLNFSQS AHGAGDQQLGGGAAAGNLSLSLVDKDLDSFEGSLGSHFEFPDYCTPELSEMIAGDWLEANFS	448
Cow_SOX-11	DLVFTY	451
Buffalo_SOX-11	DLVFTY	455
Goat_SOX-11	DLVFTY	455
Sheep_SOX-11	DLVFTY	454

Figure S11. Comparative amino acid analysis of Sox11 gene in cattle, buffalo, sheep, and goat

Cow_SOX-12	MVQQRGARAKRDGGPPPGPGPAEEGAREPGWCKTPSGHIKRPMAFMVWSQHERRKIMDQWPDHNAEISKRLGRRWQLLDSEKIPFV	90
Buffalo_SOX-12	MVQQRGARAKRDGGPPPGPGPAEEGAREPGWCKTPSGHIKRPMAFMVWSQHERRKIMDQWPDHNAEISKRLGRRWQLLDSEKIPFV	90
Goat_SOX-12	MVQQRGARAKRDGGPPPGPGPAEEGAREPGWCKTPSGHIKRPMAFMVWSQHERRKIMDQWPDHNAEISKRLGRRWQLLDSEKIPFV	90
Sheep_SOX-12	MVQQRGARAKRDGGPPPGPGPAEEGAREPGWCKTPSGHIKRPMAFMVWSQHERRKIMDQWPDHNAEISKRLGRRWQLLDSEKIPFV	90
Cow_SOX-12	REAERLRLKHMADYPDYKYRPRKSKGAPAKARPRPPGGGGGSRLLKPGPQLPGRGRRRAAGGPLGGGAAAPEDDDDEDEELLEVLVE	180
Buffalo_SOX-12	REAERLRLKHMADYPDYKYRPRKSKGAPAKARPRPPGGGGGSRLLKPGPQLPGRGRRRAAGGPLGGGAAAPEDDDDEDEELLEVLVE	180
Goat_SOX-12	REAERLRLKHMADYPDYKYRPRKSKGAPAKARPRPPGGGGGSRLLKPGPQLPGRGRRRAAGGPLGGGAAAPEDDDDEDEELLEVLVE	180
Sheep_SOX-12	REAERLRLKHMADYPDYKYRPRKSKGAPAKARPRPPGGGGGSRLLKPGPQLPGRGRRRAAGGPLGGGAAAPEDDDDEDEELLEVLVE	180
Cow_SOX-12	TPGRELWRMVPAGRAARGPVERAQGPSGEGAAVTAASPTPSEDEEPEEEEEEEEEEEGEEKVASGEEPLGFLSRGPPGPAGLDCSALD	270
Buffalo_SOX-12	TPGRELWRMVPAGRAARGPVERAQGPSGEGAAVTAASPTPSEDEEPEEEEEEEEEEEGEEKVASGEEPLGFLSRGPPGPAGLDCSALD	270
Goat_SOX-12	TPGRELWRMVPAGRAARGPVERAQGPSGEGAAVTAASPTPSEDEEPEEEEEEEEEEEGEEKVASGEEPLGFLSRGPPGPAGLDCSALD	270
Sheep_SOX-12	TPGRELWRMVPAGRAARGPVERAQGPSGEGAAVTAASPTPSEDEEPEEEEEEEEEEEGEEKVASGEEPLGFLSRGPPGPAGLDCSALD	270
Cow_SOX-12	RDPDLPPPSGTSHFEFPDYCTPEVTEMIAGDWRPSSIADLVFTY	314
Buffalo_SOX-12	RDPDLPPPSGTSHFEFPDYCTPEVTEMIAGDWRPSSIADLVFTY	314
Goat_SOX-12	RDPDLPPPSGTSHFEFPDYCTPEVTEMIAGDWRPSSIADLVFTY	314
Sheep_SOX-12	RDPDLPPPSGTSHFEFPDYCTPEVTEMIAGDWRPSSIADLVFTY	314

Figure S12. Comparative amino acid analysis of Sox12 gene in cattle, buffalo, sheep, and goat

Cow_SOX-13	MERPGAAPAAPPPPGWPPRFPGLTSPRSWKQAPFLHPFLMMSMRSPGSAQLVLDEVGTMVNC	TVKAEKKKEPCYEDPQGSATAAHSQPG	90
Buffalo_SOX-13	MERPRAAAAAPPPPGWPPRFPGLTSPRSWKQAPFLHPFLMMSMRSPGSAQLVLDEVGTMVNC	TVKAEKKKEPCYEDPQGSATAAHSQPG	90
Goat_SOX-13	-----MMSMRSPGSAQLVLDEVGTMVNC	SVKAEKKKEPCYEDPQGSATAAHLQPG	49
Sheep_SOX-13	MERAGAAPAAPPPPGWPPRFPGLTSPRSWKQAPFLHPFLMMSMRSPGSAQLVLDEVGTMVNC	SVKAEKKKEPCYEDPQGSATAAHSQPG	90
Cow_SOX-13	DPARTFPQNGADPQAPTQGGDRDIQCVSQDSSSLENSESPEPRRPGGSEAASGSQEKLDFNRLKEVVPAIEKLLSSD	WKEKFLGRSSVETK	180
Buffalo_SOX-13	DPARTFPQNGADPQAPAQGGDRDIQCVLQDSSSLENSESPEPRRPGGSEAASGSQEKLDFNRLKEVVPAIEKLLSSD	WKEKFLGRSSVETK	180
Goat_SOX-13	DPARPAQNGADLQAPAQ-----DSSSLENSESPEPRRPGGSEAASGSQEKLDFNRLKEVVPAIEKLLSSD	WKEKFLGRSSVETK	129
Sheep_SOX-13	DPARPAQNGADLQAPAQ-----DSSSPENSESPEPRRPGGSEAASGSQEKLDFNRLKEVVPAIEKLLSSD	WKEKFLGRSSVETK	170
Cow_SOX-13	DVKGTKESLAEKELQLLVMIHQLSALRDQLLTAHSEQKNMAAMLLEKQQQOMELARQQQEQTAKQQQQLIQQQHKINLLQQQIQQVNMMPY		270
Buffalo_SOX-13	DVKGTKESLAEKELQLLVMIHQLSALRDQLLTAHSEQKNMAAMLLEKQQQOMELARQQQEQTAKQQQQLIQQQHKINLLQQQIQQVNMMPY		270
Goat_SOX-13	DVKGTKESLAEKELQLLVMIHQLSALRDQLLTAHSEQKNMAAMLLEKQQQOMELARQQQEQTAKQQQQLIQQQHKINLLQQQIQQVNMMPY		219
Sheep_SOX-13	DVKGTKESLAEKELQLLVMIHQLSALRDQLLTAHSEQKNMAAMLLEKQQQOMELARQQQEQTAKQQQQLIQQQHKINLLQQQIQQVNMMPY		260
Cow_SOX-13	VMIPAFPPSHQPLPVTTPDSQLALPIQPIPCPKVEYPLQLLHSPPAFVVKRPGALFAHHPLQEPSQPLNLTAKPKASELPNSSSSPNLKLS		360
Buffalo_SOX-13	VMIPAFPPSHQPLPVTTPDSQLALPIQPIPCPKVEYPLQLLHSPPAFVVKRPGALFAHHPLQEPSQPLNLTAKPKASELPNSSSSPNLKLS		360
Goat_SOX-13	VMIPAFPPSHQPLPVTTPDSQLALPIQPIPCPKVEYPLQLLHSPPAFVVKRPGPLSAHHPLQEPSQPLNLTAKPKASELPNSSSSPNLKLS		309
Sheep_SOX-13	VMIPAFPPGHQPLPVTTPDSQLALPIQPIPCPKVEYPLQLLHSPPAFVVKRPGPLSAHHPLQEPSQPLNLTAKPKASELPNSSSSPNLKLS		350

Cow_SOX-13	NCGPRPPSHGAPTLDLQANPPSLPLGFLGEGDAVTKAIQDARQLLHGHSALDTSPSAPFRKDLISVDTSPAKERLEDSCVHPLEEAMLG	450
Buffalo_SOX-13	NCGPRPPSHGAPTLDLQANPPSLPLGFLGEGDAVTKAIQDARQLLHGHSALDTSPSAPFRKDLISVDTSPAKERLEDSCVHPLEEAMLG	450
Goat_SOX-13	NCGPRPPSHGAPTLDLQANPPSLPLGFLGEGDAVTKAIQDARQLLHGHSALDTSPSAPFRKDLISVDTSPAKERLEDSCVHPLEEAMLG	399
Sheep_SOX-13	NCGPRPPSHGAPTLDLQANPPSLPLGFLGEGDAVTKAIQDARQLLHGHSALDTSPSAPFRKDLISVDTSPAKERLEDSCVHPLEEAMLG	440
Cow_SOX-13	CDMDGSRHFPESRNSSHIKRPMAFMVWAKDERRKILQAFPMHNSISIKILGSRWKSMSNQERQPYEEQARLSRQHLEKYPDYKYPKPR	540
Buffalo_SOX-13	CDMDGSRHFPESRNSSHIKRPMAFMVWAKDERRKILQAFPMHNSISIKILGSRWKSMSNQERQPYEEQARLSRQHLEKYPDYKYPKPR	540
Goat_SOX-13	CDMDGSRHFPESRNSSHIKRPMAFMVWAKDERRKILQAFPMHNSISIKILGSRWKSMSNQERQPYEEQARLSRQHLEKYPDYKYPKPR	489
Sheep_SOX-13	CDMDGSRHFPESRNSSHIKRPMAFMVWAKDERRKILQAFPMHNSISIKILGSRWKSMSNQERQPYEEQARLSRQHLEKYPDYKYPKPR	530
Cow_SOX-13	PKRTCIVEGKRLRVGEYKALMTRRRQDARQSYATPQQTSGVQMSPSSEVLYPRVAGVPLAQPLVEHCVPRLDPNMPVIVNTCSLREEGEG	630
Buffalo_SOX-13	PKRTCIVEGKRLRVGEYKALMTRRRQDARQSYATPQQTSGVQMSPSSEVLYPRVAGVPLAQPLVEHCVPRLDPNMPVIVNTCSLREEGEG	630
Goat_SOX-13	PKRTCIVEGKRLRVGEYKALMTRRRQDARQSYATPQQTSGVQMSPSSEVLYPRVAGVPLAQPLVEHCVPRLDPNMPVIVNTCSLREEGEG	579
Sheep_SOX-13	PKRTCIVEGKRLRVGEYKALMTRRRQDARQSYATPQQTSGVQMSPSSEVLYPRVAGVPLAQPLVEHCVPRLDPNMPVIVNTCSLREEGEG	620
Cow_SOX-13	TEDRHSAADGEVYRYSEDEDSEGEKSDGELVVLT	666
Buffalo_SOX-13	TEDRHSAADGEVYRYSEDEDSEGEKSDGELVVLT	666
Goat_SOX-13	AEDRHSAADGEVYRYSEDEDSEGEKSDGELVVLT	615
Sheep_SOX-13	AEDRHSAADGEVYRYSEDEDSEGEKSDGELVVLT	656

Figure S13. Comparative amino acid analysis of Sox13 gene in cattle, buffalo, sheep, and goat

Cow_SOX-14	MSKPSDHIKRPMAFMVWSRGQRRKMAQENPKMHNSEISKRLGAEWKLLSEAEKRPYIDEAKRLRAQHMKEHPDYKYRPRRKPNLLKKD	90
Buffalo_SOX-14	MSKPSDHIKRPMAFMVWSRGQRRKMAQENPKMHNSEISKRLGAEWKLLSEAEKRPYIDEAKRLRAQHMKEHPDYKYRPRRKPNLLKKD	90
Goat_SOX-14	MSKPSDHIKRPMAFMVWSRGQRRKMAQENPKMHNSEISKRLGAEWKLLSEAEKRPYIDEAKRLRAQHMKEHPDYKYRPRRKPNLLKKD	90
Sheep_SOX-14	MSKPSDHIKRPMAFMVWSRGQRRKMAQENPKMHNSEISKRLGAEWKLLSEAEKRPYIDEAKRLRAQHMKEHPDYKYRPRRKPNLLKKD	90
Cow_SOX-14	RYVFPLPYLGD TDPLKAAGLPVGASDGLLSAPEKARAF LPPASAPYSLDPAQFSSSAIQKMGEVPHTLATGALPYASTLG YQNGAFGSL	180
Buffalo_SOX-14	RYVFPLPYLGD TDPLKAAGLPVGASDGLLSAPEKARAF LPPASAPYSLDPAQFSSSAIQKMGEVPHTLATGALPYASTLG YQNGAFGSL	180
Goat_SOX-14	RYVFPLPYLGD TDPLKAAGLPVGASDGLLSAPEKARAF LPPASAPYSLDPAQFSSSAIQKMGEVPHTLATGALPYASTLG YQNGAFGSL	180
Sheep_SOX-14	RYVFPLPYLGD TDPLKAAGLPVGASDGLLSAPEKARAF LPPASAPYSLDPAQFSSSAIQKMGEVPHTLATGALPYASTLG YQNGAFGSL	180
Cow_SOX-14	SCPSQHTHTHPSTNPGYVVPNCNTAWSASTLQPPVAYILFPGMTKTGIDPYSSAHATAM	240
Buffalo_SOX-14	SCPSQHTHTHPSTNPGYVVPNCNTAWSASTLQPPVAYILFPGMTKTGIDPYSSAHATAM	240
Goat_SOX-14	SCPSQHTHTHPSTNPGYVVPNCNTAWSASTLQPPVAYILFPGMTKTGIDPYSSAHATAM	240
Sheep_SOX-14	SCPSQHTHTHPSTNPGYVVPNCNTAWSASTLQPPVAYILFPGMTKTGIDPYSSAHATAM	240

Figure S14. Comparative amino acid analysis of Sox14 gene in cattle, buffalo, sheep, and goat

Cow_SOX-15	MAVPGSSHDQAWNLDPTPTAPTSSSSGQEREGAGSPVVSRLPLEKVKRPMNAFMVWSSAQRRQMAQQNPKMHNSEISKRLGAQWKLL	90
Buffalo_SOX-15	MAVPGSSHDQAWNLDPTPTAPTSSSSGQEREGAGSPVVSRLPLEKVKRPMNAFMVWSSAQRRQMAQQNPKMHNSEISKRLGAQWKLL	90
Goat_SOX-15	MAVPGSSHDQAWNLDPTPTAPTSSSSGQEREGAGSPVVSRLPLEKVKRPMNAFMVWSSAQRRQMAQQNPKMHNSEISKRLGAQWKLL	90
Sheep_SOX-15	MAVPGSSHDQAWNLDPTPTAPTSSSSGQEREGAGSPVVSRLPLEKVKRPMNAFMVWSSAQRRQMAQQNPKMHNSEISKRLGAQWKLL	90
Cow_SOX-15	GEDEKRPFVEEAKRLRARHLRDYPDYKYRPRRKTSAGAGSPHFSQSGSGVAGGGPVWGPYAAANQSGRFGYQPPNYSTAYLPGSYGSS	180
Buffalo_SOX-15	GEDEKRPFVEEAKRLRARHLRDYPDYKYRPRRKTSAGAGSPHFSQSGSGVAGGGPVWGPYAAANQSGRFGYQPPNYSTAYLPGSYGSS	180
Goat_SOX-15	GEDEKRPFVEEAKRLRARHLRDYPDYKYRPRRKTSAGAGSPHFSQSGSGVAGSGPVWGPYAAANQSGRFGYQPPNYSTAYLPGSYGSS	180
Sheep_SOX-15	GEDEKRPFVEEAKRLRARHLRDYPDYKYRPRRKTSAGAGSPHFSQSGSGVAGSGPVWGPYAAANQSGRFGYQPPNYSTAYLPGSYGSS	180
Cow_SOX-15	HCKPEGSPSCSLPQSNPRLQGELLTAYSPLYEPGSPPLYNPPLSGTPLPLTHL	233
Buffalo_SOX-15	HCKPEGSPSCSLPQSNPRLQGELLTAYSPLYEPGSPPLYNPPLSGTPLPLTHL	233
Goat_SOX-15	HCKPEGSPSCSLPQSNPRLQGELLTAYSPLYEPGSPPLYNPPLSGTPLPLTHL	233
Sheep_SOX-15	HCKPEGSPSCSLPQSNPRLQGELLTAYSPLYEPGSPPLYNPPLSGTPLPLTHL	233

Figure S15. Comparative amino acid analysis of Sox15 gene in cattle, buffalo, sheep, and goat

Cow_SOX-17	MSSPDAGYASDEQSQPRSAIPAVMAGLGPCPWAESLSPLGDMKMKGEAAASAGAPAGPAGRAKGESRIRRPMAFMVWAKDERKRLAQQN	90
Buffalo_SOX-17	MSSPDAGYASDEQSQPRSAIPAVMAGLGPCPWAESLSPLGDMKMKGEAAASGGAPAGPAGRAKGESRIRRPMAFMVWAKDERKRLAQQN	90
Goat_SOX-17	MSSPDAGYASDEQSQPRSAIPAVMAGLGPCPWAESLSPLGDMKMKGEAAASGGAPAGPAGRAKGESRIRRPMAFMVWAKDERKRLAQQN	90
Sheep_SOX-17	MSSPDAGYASDEQSQPRSAIPAVMAGLGPCPWAESLSPLGDMKMKGEAAASGGAPAGPAGRAKGESRIRRPMAFMVWAKDERKRLAQQN	90
Cow_SOX-17	PDLHNAELSKMLGKSWKALTAEKRPFVEEAERLRVQHMQDHPNYKYRPRRRQVKRLKRVEGGFLHGLAEPPAAALGPEGGRVAMDGLG	180
Buffalo_SOX-17	PDLHNAELSKMLGKSWKALTAEKRPFVEEAERLRVQHMQDHPNYKYRPRRRQVKRLKRVEGGFLHGLAEPPAAALGPEGGRVAMDGLG	180
Goat_SOX-17	PDLHNAELSKMLGKSWKALTAEKRPFVEEAERLRVQHMQDHPNYKYRPRRRQVKRLKRVEGGFLHGLAEPPAAALGPEGGRVAMDGLG	180
Sheep_SOX-17	PDLHNAELSKMLGKSWKALTAEKRPFVEEAERLRVQHMQDHPNYKYRPRRRQVKRLKRVEGGFLHGLAEPPAAALGPEGGRVAMDGLG	180
Cow_SOX-17	LPFPEQGFPAGPPLLPPHLGGHYRDCPGLGAPQLDGYLPTPDTSPLDGVEPDPAFFAAPLPADCPAPGPYSYAPAADYAGPPEPPGAGP	270
Buffalo_SOX-17	LPFPEQGFPAGPPLLPPHLGGHYRDCPGLGAPQLDGYLPTPDTSPLDGVEPDPAFFAAPLPADCPAPGPYSYAPAADYAGPPEPPGAGP	270
Goat_SOX-17	LPFPEQGFPAGPPLLPPHLGGHYRDCPGLGAPQLDGYLPTPDTSPLDGVEPDPAFFAAPLPADCPAPGPYSYAPAADYAGPPEPPGAGP	270
Sheep_SOX-17	LPFPEQGFPAGPPLLPPHLGGHYRDCPGLGAPQLDGYLPTPDTSPLDGVEPDPAFFAAPLPADCPAPGPYSYAPAADYAGPPEPPGAGP	270
Cow_SOX-17	LHPRLGPEPAGPAMPGLLAPPSALHMYIGPVGSQAAAAGGGGRGFQMPQPPEHGGPGQSPPPPEALHCRDSAEPGAPAEELLGEVERTEFE	360
Buffalo_SOX-17	LHPRLGPEPAGPAMPGLLAPPSALHMYIGPVGSQAAAAGGGGRGFQMPQPPEHGGPGQSPPPPEALHCRDSAEPGAPAEELLGEVERTEFE	360
Goat_SOX-17	LHPRLGPETAGPAMPGLLAPPSALHMYIGPVGSQAAAAGGGGRGFQMPQPPEHGGPGQSPPPPEALHCRDSAEPGAPAEELLGEVERTEFE	360
Sheep_SOX-17	LHPRLGPETAGPAMPGLLAPPSALHMYIGPVGSQAAAAGGGGRGFQMPQPPEHGGPGQSPPPPEALHCRDSAEPGAPAEELLGEVERTEFE	360
Cow_SOX-17	QYLHFVCKPEMGLPYPGHDAGVTLPDGHGALSSVVS DASSAVYYCNYPDV	410
Buffalo_SOX-17	QYLHFVCKPEMGLPYPGHDAGVTLPDGHGALSSVVS DASSAVYYCNYPDV	410
Goat_SOX-17	QYLHFVCKPEMGLPYPGHDAGVTLPDGHGALSSVVS DASSAVYYCNYPDV	410
Sheep_SOX-17	QYLHFVCKPEMGLPYPGHDAGVTLPDGHGALSSVVS DASSAVYYCNYPDV	410

Figure S16. Comparative amino acid analysis of Sox17 gene in cattle, buffalo, sheep, and goat

Cow_SOX-18	MQRSPLGYGAQDDPPARRDCAWAPGPGAAAEPRLPAVPVVP---TAPAAPASPPSPRRSPRSPEPGRYGLSPAGRGERQGTDESRIIR	87
Buffalo_SOX-18	MQRSPLGYGAQDDPPARRDCAWAPGPGAAAEPRLPAVPVVP---TAPAAPASPPSPRRSPRSPEPGRYGLSPAGRGERQGTDESRIIR	87
Goat_SOX-18	MQRSPLGYGAQDDPPARRDCAWAPGPGAAAEPRLPAVPVVPVAPTAPAAPASPPSPRRSPRSPEPGRYGLSPAGRGERQGTDESRIIR	90
Sheep_SOX-18	MQRSPLGYGAQDDPPARRDCAWAPGPGAAAEPRLPAVPVVP---TAPAAPASPPSPRRSPRSPEPGRYGLSPAGRGERQGTDESRIIR	87
Cow_SOX-18	PMNAFMVWAKDERKRRLAQONPDLHNAVLSKMLGKAWKELSPA EKRPFVEEAERLRVQHRLDHPNYKYP RRRKKQARKARRLEPGLLLPGL	177
Buffalo_SOX-18	PMNAFMVWAKDERKRRLAQONPDLHNAVLSKMLGKAWKELSPA EKRPFVEEAERLRVQHRLDHPNYKYP RRRKKQARKARRLEPGLLLPGL	177
Goat_SOX-18	PMNAFMVWAKDERKRRLAQONPDLHNAVLSKMLGKAWKELSPA EKRPFVEEAERLRVQHRLDHPNYKYP RRRKKQARKARRLESGLLLPGL	180
Sheep_SOX-18	PMNAFMVWAKDERKRRLAQONPDLHNAVLSKMLGKAWKELSPA EKRPFVEEAERLRVQHRLDHPNYKYP RRRKKQARKARRLESGLLLPGL	177
Cow_SOX-18	APPPPPPPPE--FFPAATGPARVFRELPLPGA EFDGLGLTPERSPLDGLPEGA AAFPPPAAPEDCSLRAFRAPYGAELPRNPGGCFCG	265
Buffalo_SOX-18	APPPPPPPPE--FFPAATGPARVFRELPLPGA EFDGLGLTPERSPLDGLPEGA AAFPPPAAPEDCSLRAFRAPYGAELPRNPGGCFCG	265
Goat_SOX-18	APPPPPPPPE-FFPAATGPARVFRELPLPGA EFDGLGLTPERSPLDGLPEGA AAFPPPAAPEDCSLRAFRAPYGAELPRNPGGCFCG	269
Sheep_SOX-18	APPPPPPPPEFFPAATGPARVFRELPLPGA EFDGLGLTPERSPLDGLPEGA AAFPPPAAPEDCSLRAFRAPYGAELPRNPGGCFCG	267
Cow_SOX-18	APPAEALRTAPGPAAQLCGLYYSAPGAPGPGP--YPGPLSPPEAPPLESAEPLGPAADLWADVDLTEFDQYLNCSRTRPDAAGLPYHVA	353
Buffalo_SOX-18	APPAEALRTAPGPAAQLCGLYYSAPGAPGPGP--YPGPLSPPEAPPLESAEPLGPAADLWADVDLTEFDQYLNCSRTRPDAAGLPYHVA	355
Goat_SOX-18	APPAEALRTAPGPAAQLCGLYYSAPGAPGPGP--YPGPLSPPEAPPLESAEPLGPAADLWADVDLTEFDQYLNCSRTRPDAAGLPYHVA	357
Sheep_SOX-18	APPAEALRTAPGPAAQLCGLYYSAPGAPGPGP--YPGPLSPPEAPPLESAEPLGPAADLWADVDLTEFDQYLNCSRTRPDAAGLPYHVA	355
Cow_SOX-18	LAKLAPRTMSCPEESSLIAALSDASSAVVYSACISG	389
Buffalo_SOX-18	LAKLAPRTMTCPPESSLIAALSDASSAVVYSACISG	391
Goat_SOX-18	LAKLAPRTMSCPEESSLIAALSDASSAVVYSACISG	393
Sheep_SOX-18	LAKLAPRTMSCPEESSLIAALSDASSAVVYSACISG	391

Figure S17. Comparative amino acid analysis of Sox18 gene in cattle, buffalo, sheep, and goat

Cow_SOX-21	MSKPVDHVKRPMNAFMVWSRAQRRKMAQENPKMHNSEISKRLGA EWKLLTESEKRPFIDEAKRLRAMHMK EHPDYKYRPRRKPKTLLKKD	90
Buffalo_SOX-21	MSKPVDHVKRPMNAFMVWSRAQRRKMAQENPKMHNSEISKRLGA EWKLLTESEKRPFIDEAKRLRAMHMK EHPDYKYRPRRKPKTLLKKD	90
Goat_SOX-21	MSKPVDHVKRPMNAFMVWSRAQRRKMAQENPKMHNSEISKRLGA EWKLLTESEKRPFIDEAKRLRAMHMK EHPDYKYRPRRKPKTLLKKD	90
Sheep_SOX-21	MSKPVDHVKRPMNAFMVWSRAQRRKMAQENPKMHNSEISKRLGA EWKLLTESEKRPFIDEAKRLRAMHMK EHPDYKYRPRRKPKTLLKKD	90
Cow_SOX-21	KFAFPVPYGLGGVADAEHPALKAGAGLHAGAGSGGLVPESLLANPEKAAAAA AAAAAAARVFFPQSAAAAA AAAAAAAGSPYSLLDLGSKM	180
Buffalo_SOX-21	KFAFPVPYGLGGVADAEHPALKAGAGLHAGAGSGGLVPESLLANPEKAAAAA AAAAAAARVFFPQSAAAAA AAAAAAAGSPYSLLDLGSKM	180
Goat_SOX-21	KFAFPVPYGLGGVADAEHPALKAGAGLHAGAGSGGLVPESLLANPEKAAAAA AAAAAAARVFFPQSAAAAA AAAAAAAGSPYSLLDLGSKM	180
Sheep_SOX-21	KFAFPVPYGLGGVADAEHPALKAGAGLHAGAGSGGLVPESLLANPEKAAAAA AAAAAAARVFFPQSAAAAA AAAAAAAGSPYSLLDLGSKM	180
Cow_SOX-21	AEISSSSSGLPYASSLGYPTAGAGAFHGAAAAA AAAAAAAGGHTSHSPSGNPGYMIPCNC SAWPSPGLQPPLAYIILLPGMGKPQLDPYP	270
Buffalo_SOX-21	AEISSSSSGLPYASSLGYPTAGAGAFHGAAAAA AAAAAAAGGHTSHSPSGNPGYMIPCNC SAWPSPGLQPPLAYIILLPGMGKPQLDPYP	270
Goat_SOX-21	AEISSSSSGLPYASSLGYPTAGAGAFHGAAAAA AAAAAAAGGHTSHSPSGNPGYMIPCNC SAWPSPGLQPPLAYIILLPGMGKPQLDPYP	270
Sheep_SOX-21	AEISSSSSGLPYASSLGYPTAGAGAFHGAAAAA AAAAAAAGGHTSHSPSGNPGYMIPCNC SAWPSPGLQPPLAYIILLPGMGKPQLDPYP	270
Cow_SOX-21	AAAAAAL	277
Buffalo_SOX-21	AAAAAAL	277
Goat_SOX-21	AAAAAAL	277
Sheep_SOX-21	AAAAAAL	277

Figure S18. Comparative amino acid analysis of Sox21 gene in cattle, buffalo, sheep, and goat

Cow_SOX-30	MERARPEQPPQQRQLPRATPPRPLRPAPPLPVEGASFRAAAATEPSPSPPTPCAAAATVASSCGEPSASGVQPAARRLLQVKPEQVLLL	90
Buffalo_SOX-30	MERARPEQPPQQRQLPRATPPRPLRPAPPLPVEGASFRAAVTEPSPSPPTPCAAAATVASSCGEPSASGVQPAARRLLQVKPEQVLLL	90
Goat_SOX-30	MERARPEQPPQQRQLPRATPPRPLRPAPPLPVEGASFRAAAAEPSPSPTPCAAAATVASSCGEPSASGVQPAARRLLQVKPEQVLLL	90
Sheep_SOX-30	MERARPEQPPQQRQLPRATPPRPLRPAPPLPVEGASFRAAAAEPSPSPTPCAAAATVASSCGEPSASGVQPAARRLLQVKPEQVLLL	90
Cow_SOX-30	PPGPPLPQAREESAATSPAQARLLQLRPELLLLPPPPPASEGIPCRPELHPLQPRALHVKAEKQEPGPGDLLAGPRRAVEACPKTSRTV	180
Buffalo_SOX-30	PPGPPLPQAREEGAATSPAQARLLQLRSELLLLPPPPPASEGIPCRPELHPLQPRALHVKAEKQEPGPGDLLAGPRRAVEACPKTSRRV	180
Goat_SOX-30	PPGPPLPQAREEGAATSPAQARLLQLRPELLLLPPPPPASEGVPCELPPELHPLQPRALHVKAEKQEPGPGDLLAGPRRAVEACPKTSRTV	180
Sheep_SOX-30	PPGPPLPQAREEGAATSPAQARLLQLRPELLLLPPPPPASEGVPCELPPELHPLQPRALHVKAEKQDPGPGDLLAGPRRAVEACPKTSRTV	180
Cow_SOX-30	KAEGSGPLNSRRGEKKKLEAEIIVSYAAKGEEGKSLAVLREGVIKTEAPERLREDCRLSTEPASNGLAHGSKDVILTQPSAFGPHQQ	270
Buffalo_SOX-30	KAEGSGPLNSRRGEKKKLEAEIIVSYAAKGEEGKSLAVLREGVIKTEAPERLREDCRLSTEPASNGLAHGSKDVILTQPSAFGPHQQ	270
Goat_SOX-30	KAEGSGPLNSRRGEKKKLEAEIIVSYAAKGEEGKSLAALREGVIKTEAPERLREDCRLSTEPASNGLAHGSKDVILTQPSAFGPHQQ	270
Sheep_SOX-30	KGECSGPLNSRRGEKKKLEAEIIVSYAKGEEGKSLAALREGGIKTEAPERLREDCRLSTEPASNGLAHGSKDVILTQPSAFGPHQQ	270
Cow_SOX-30	DLRIPLTLHTVPPGARIQFQGPPSELIRLTKVPLTPVPIKMQSLLEPSVKIETKDVPLTVLPSDAGIPDTPFSKDRNGHVKRPMAFMV	360
Buffalo_SOX-30	DLRIPLTLHTVPPGARIQFQGPPSELIRLTKVPLTPVPIKMQSLLEPSVKIETKDVPLTVLPSDAGIPDTPFSKDRNGHVKRPMAFMV	360
Goat_SOX-30	DLRIPLTLHTVPPGARIQFQGPPSELIRLTKVPLTPVPIKMQSLLEPSVKIETKDVPLTVLPSDAGIPDTPFSKDRNGHVKRPMAFMV	360
Sheep_SOX-30	DLRIPLTLHTVPPGARIQFQGPPSELIRLTKVPLTPVPIKMQSLLEPSVKIETKDVPLTVLPSDAGIPDTPFSKDRNGHVKRPMAFMV	360
Cow_SOX-30	WARIHRPALAKANPAANNAEISVOLGLEWNKLSEEQKKPYDEAQKIKEKHREEFPGWVYQPRPGKRKRFPPLSVSVFSGTTQNIISTNP	450
Buffalo_SOX-30	WARIHRPALAKANPAANNAEISVOLGLEWNKLSEEQKKPYDEAQKIKEKHREEFPGWVYQPRPGKRKRFPPLSVSVFSGTTQNIISTNP	450
Goat_SOX-30	WARIHRPALAKANPAANNAEISVOLGLEWNKLSEEQKKPYDEAQKIKEKHREEFPGWVYQPRPGKRKRFPPLSVSVFSGTTQNIISTNP	450
Sheep_SOX-30	WARIHRPALAKANPAANNAEISVOLGLEWNKLSEEQKKPYDEAQKIKEKHREEFPGWVYQPRPGKRKRFPPLSVSVFSGTTQNIISTNP	450
Cow_SOX-30	-TIYPYRSPTYSVVIPSLONAITHPVGESPTIQLPTPAVQRPSITLFPQSVSSTAQVAVQAPSLPLRPALPPQRFAGPSQADTHQLHS	539
Buffalo_SOX-30	-TIYPYRSPTYSVVIPSLONAITHPVGESPTIQLPTPAVQRPSITLFPQSVSSTAQVAVQAPSLPLRPALPPQRFAGPSQADTHQLHS	539
Goat_SOX-30	TIYPYRSPTYSVVIPSLONTITHPVGESPTIQLPTPAVQRPSITLFPQSVSSTAQVAVQAPSLPLRPALPPQRFAGPSQADTHQLHS	540
Sheep_SOX-30	TIYPYRSPTYSVVIPSLONTITHPVGESPTIQLPTPAVQRPSITLFPQSVSSTAQVAVQAPSLPLRPALPPQRFAGPSQADTHQLHS	540
Cow_SOX-30	GVNRSVKRPTPVSLSTNRIPTSASPAHSRFATSTIQPKKEYPSVSTCPNSTPISQAPPPIPHSHIYQPSPLGHPAALFGTTPPRFSFHHPY	629
Buffalo_SOX-30	GVNRSVKRPTPVSLSTNRIPTSASPAHSRFATSTIQPKKEYPSVSTCPNSTPISQAPPPIPHSHVFPPLGHPAALFGTTPPRFSFHHPY	629
Goat_SOX-30	GVNRSVKRPTPVSLSTNRIPTSASPAHSRFSTSTIQPKKEYPSVSTCPNSTPISQAPPPIPHSHVYQPSPLGHPAALFGTTPPRFSFHHPY	630
Sheep_SOX-30	GVNRSVKRPTPVSLSTNRIPTSASPAHSRFSTSTIQPKKEYPSVSTCPNSTPISQAPPPIPHSHVYQPSPLGHPAALFGTTPPRFSFHHPY	630
Cow_SOX-30	FLPGPHYFPSSTCPYSRPPFGYGNFPSSMPECLGYIEDRYQKHEAMFSALNRDYPFRDYPDERAHNEDSRSCENMDGTSYYNSHCHSGEE	719
Buffalo_SOX-30	FLPGPHYFPSSTCPYSRPPFGYGNFPSSMPECLGYIEDRYQKHEAMFSALNRDYPFRDYPDERAHNEDSRSCENMDGTSYYNSHCHSGEE	719
Goat_SOX-30	FLPGPHYFPSSTCPYSRPPFGYGNFPSSMPECLGYIEDRYQKHEAMFSALNRDYPFRDYPDERAHNEDSRSCENMDGTSYYNSHCHSGEE	720
Sheep_SOX-30	FLPGPHYFPSSTCPYSRPPFGYGNFPSSMPECLGYIEDRYQKHEAMFSALNRDYPFRDYPDERAHNEDSRSCENMDGTSYYNSHCHSGEE	720
Cow_SOX-30	YLNPIQLDIGALENVFTAPTSTPSSIQQVNVTDSDDEEEEEKVLRNL	766
Buffalo_SOX-30	YLNPMQLDIGALENVFTAPTSTPSSIQQVNVTDSDDEEEEEKVLRNL	766
Goat_SOX-30	YLNPMQLDIGALENVFTAPTSTPSSIQQVNVTDSDDEEEEEKVLRNL	767
Sheep_SOX-30	YLNPMQLDIGALENVFTAPTSTPSSIQQVNVTDSDDEEEEEKVLRNL	767

Cow_SOX-1	AGANGTVPLTHI	369
Buffalo_SOX-1	AGANGTVPLTHI	370
Goat_SOX-1	AGANGTVPLTHI	372
Sheep_SOX-1	AGANGTVPLTHI	371

Figure S19. Comparative amino acid analysis of Sox30 gene in cattle, buffalo, sheep, and goat

SRY_Cow	-----MFRVLNDDVYSPAVVQQTTLAFRKDSSLCTDSHSANDQCERGEHVRESSQDHVKRPMNAFIVTSRERRRKVALENPRM	79
SRY_Buffalo	-----MFRVLNDDVYSPAGVQHNLAFRKDSSSCTDSHSANDQCERGENVRESSQDHVKRPMNAFIVTSRERRRKVALENPRM	79
SRY_Goat	MNRTVQSYASAMFRVLKDDVYSPAVVQQTTFAFGKTSSLCTDNHSANDQCERGENVRESSQDHVKRPMNAFIVTSRERRRKVALENPKL	90
SRY_Sheep	MNRTVQSYASAMFRVLKDDVYSPAVVQQTTFAFGKTSSLCTDNHSANDQCERGENVRESSQNHVKRPMNAFIVTSRERRRKVALENPKL	90
SRY_Cow	FNSDISKQLGYEWKRLTDAEKRPFEEAQRLLAIHRDKYPGYKYRPRRAKRPQKSLPADSSILCNPMHVETLHPFTYRDGCAKTTYSQM	169
SRY_Buffalo	FNSDISKQLGYEGKRLTDAEKRPFEEAQRLLSIHRDKYPGYKYRPRRAKRLQKSLPADSSILCNPMHVETLHPFTYRDGCAKTTYSQM	169
SRY_Goat	QNSEISKQLGYEWKRLTDAEKRPFEEAQRLLAIHRDKYPGYKYRPRRAKRPQKSLDADSBILCNQMDVETLHPFTYRDDCAKTTTHSQM	180
SRY_Sheep	QNSEISKQLGYEWKRLTDAEKRPFEEAQRLLAIHRDKYPGYKYRPRRAKRPQKSLDADSSILCNQMDAETLHPFTYRDDCAKTTTHSQM	180
SRY_Cow	ESQLRSQSIVIITNSLLQKEHHSSWTSLGHNKVTLATRISADFPCKNSLEPGLSCAYFQY	229
SRY_Buffalo	ESHLSRSQSIVIITNSLLQKEHHSSWTSLGHNKVTLATRISADFPFNKNSLEPGLSCAYFQY	229
SRY_Goat	ESQLCRSQSLILTNSLLQKEHHSSWTLGHDRTVLDTRISADFPFYQNSLEPGLSCAYVQY	240
SRY_Sheep	ESQLRSQSIVIITNSLLQKEHHSSWTLGHDRTVLTASRISADFPFYQNSLEPGLSCAYVQY	240

Figure S20. Comparative amino acid analysis of Sry gene in cattle, buffalo, sheep, and goat

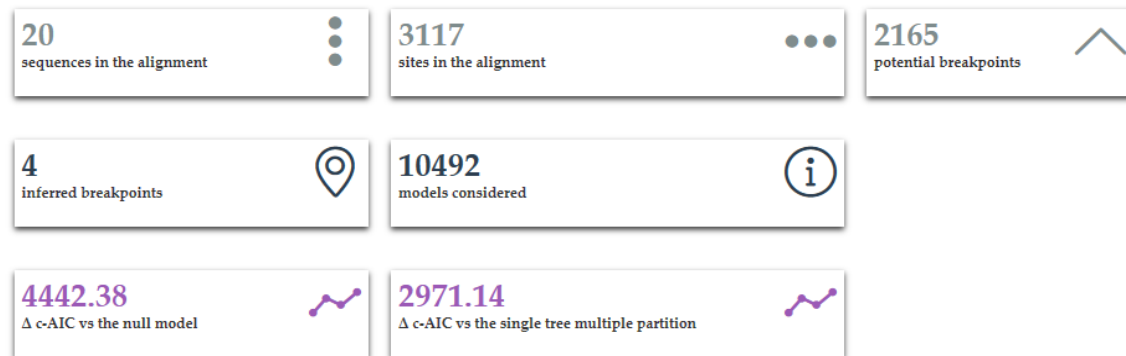


Figure S21. Analysis of GARD

Table S1: Buffalo and cattle Sox gene family with chromosome number and location

Gene	Buffalo		Cattle	
	Chromosome	Position	Chromosome	Position
SOX1	13	1124390...1127795	12	86018990..86022110
SOX2	1	130731784...130734338	1	85302293..85303771
SOX3	X	118463501...118465239	Unplaced Scaffold	4426849..4429001
SOX4	2	15869169...15873430	23	36517935..36522538
SOX5	4	33262643...34419596	5	85456814..86631212
SOX6	16	48888897...49605774	15	35834420..36548505
SOX7	3	71168529...71174671	8	8558547..8565620
SOX8	24	41398973...41403986	25	788544..793550
SOX9	3	4493353...4498743	19	58918901..58922699
SOX10	4	10196777...10207847	5	109757715..109768623
SOX11	12	90353529...90362307	11	90946223..90955282
SOX12	14	22918829...22921779	13	60689766..60694687
SOX13	5	79338823...79383069	16	1867662..1912526
SOX14	1	176274075...176276138	1	131371915..131372637
SOX15	3	35785580...35787156	19	27319235..27321042
SOX17	15	59969970...59975876	14	22229926..22231726
SOX18	14	29832918...29834810	13	53823431..53825287
SOX21	13	20645934...20650444	12	69200712..69204003
SOX30	9	41564987...41608436	7	69215442..69297855
Sry	Y	150...839	Y	42225210..42225899

Table S2. Functional effect of mutations in Sox genes in buffalo

	Mutation	Polyphen2	Mupro	Provean	I-Mutant	Phd-Snp	SIFT	SNAP ²	Predict SNP	Meta SNP	SNAP	
SOX-1												
	A223P	BENIGN	DECREASE	Neutral	Increase	Neutral	Tolerated	Effect	Neutral	Neutral	NA	Synonymous
SOX-4												
	T225A	UNKNOWN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
SOX-5												
	A84T	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
	P362S	BENIGN	DECREASE	Deleterious	Decrease	Neutral	Not Tolerated	Effect	Neutral	Neutral	NA	Non-Synonymous
SOX-6												
	L2P	UNKNOWN	DECREASE	Neutral	Decrease	Neutral	Not Tolerated	Neutral	Neutral	Neutral	NA	Non-Synonymous
	E45D	BENIGN	INCREASE	Neutral	Decrease	Neutral	Tolerated	Effect	Neutral	Neutral	NA	Synonymous
	S66P	BENIGN	INCREASE	Neutral	Increase	Neutral	Tolerated	Effect	Neutral	Neutral	NA	Synonymous
	I138M	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
	S476P	BENIGN	DECREASE	Neutral	Increase	Neutral	Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
SOX-7												
	R168S	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Effect	Neutral	Neutral	Neutral	Synonymous
	S264G	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	Neutral	Synonymous
	P276S	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Effect	Neutral	Neutral	Neutral	Synonymous
	A352G	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	Neutral	Synonymous
SOX-8												
	R42H	POSSIBLY DAMAGING	INCREASE	Neutral	Decrease	Neutral	Not Tolerated	Effect	Neutral	Neutral	NA	Synonymous
	T43A	BENIGN	DECREASE	Neutral	Decrease	Neutral	Not Tolerated	Effect	Neutral	Neutral	NA	Synonymous
	S270G	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
	T382A	BENIGN	INCREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
	S391G	PROBABLY DAMAGING	DECREASE	Neutral	Decrease	Neutral	Tolerated	Effect	Neutral	Neutral	NA	Synonymous
	Y443F	BENIGN	INCREASE	Neutral	Decrease	Disease	Not Tolerated	Effect	Deleterious	Neutral	NA	Non-Synonymous
SOX-9												
	A372P	UNKNOWN	DECREASE	Neutral	Increase	Neutral	Tolerated	Effect	Neutral	Neutral	NA	Synonymous
	P374Q	UNKNOWN	DECREASE	Neutral	Increase	Disease	Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
SOX-11												
	G351S	UNKNOWN	DECREASE	Neutral	Increase	Neutral	Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
SOX-13												

	G5R	UNKNOWN	INCREASE	Neutral	Increase	Neutral	Not Tolerated	Effect	Deleterious	Neutral	Disease	Non-Synonymous
	F20V	UNKNOWN	DECREASE	Neutral	Decrease	Neutral	Not Tolerated	Effect	Deleterious	Disease	Disease	Non-Synonymous
	F39L	UNKNOWN	DECREASE	Neutral	Decrease	Neutral	Not Tolerated	Effect	Neutral	Disease	Disease	Non-Synonymous
	T83A	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	Disease	Synonymous
	T95I	BENIGN	INCREASE	Neutral	Increase	Neutral	Not Tolerated	Effect	Neutral	Neutral	Disease	Synonymous
	T106A	BENIGN	INCREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	Neutral	Synonymous
	S116L	BENIGN	INCREASE	Neutral	Decrease	Neutral	Not Tolerated	Neutral	Neutral	Neutral	Disease	Synonymous
	G166D	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	Neutral	Synonymous
	A315T	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	Neutral	Synonymous
	G610S	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	Neutral	Synonymous
	V642M	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Effect	Neutral	Neutral	Neutral	Synonymous
SOX-15												
	D15E	BENIGN	DECREASE	Neutral	Increase	Neutral	Tolerated	Neutral	Neutral	Neutral	Neutral	Synonymous
	S124T	BENIGN	INCREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	Disease	Synonymous
	T205P	DAMAGING	DECREASE	Neutral	Decrease	Neutral	Not Tolerated	Effect	Neutral	Neutral	NA	Non-Synonymous
	P211L	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Effect	Neutral	Neutral	Neutral	Synonymous
SOX-17												
	A52G	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	Neutral	Synonymous
	P374S	UNKNOWN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	Neutral	Synonymous
SOX-18												
	A314V	BENIGN	DECREASE	Neutral	Increase	Neutral	Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
	S363T	PROBABLY DAMAGING	INCREASE	Neutral	Increase	Neutral	Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
SOX-21												
	A119T	BENIGN	INCREASE	Neutral	Decreases	Neutral	Not Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
SOX-30												
	P21S	UNKNOWN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	Neutral	Synonymous
	P28A	UNKNOWN	DECREASE	Neutral	Decrease	Neutral	Not Tolerated	Effect	Neutral	Neutral	Neutral	Non-Synonymous
	A42V	POSSIBLY DAMAGING	INCREASE	Neutral	Increase	Neutral	Not Tolerated	Neutral	Deleterious	Neutral	Neutral	Synonymous
	C53W	PROBABLY DAMAGING	INCREASE	Neutral	Increase	Neutral	Not Tolerated	Effect	Deleterious	Disease	Disease	Non-Synonymous
	S103G	BENIGN	DECREASE	Neutral	Decrease	Neutral	Not Tolerated	Neutral	Neutral	Neutral	Neutral	Synonymous

	P118S	PROBABLY DAMAGING	DECREASE	Neutral	Decrease	Neutral	Not Tolerated	Neutral	Neutral	Neutral	Neutral	Synonymous
	T179R	BENIGN	DECREASE	Neutral	Increase	Neutral	Not Tolerated	Effect	Deleterious	Neutral	Disease	Non- Synonymous
	A230V	BENIGN	INCREASE	Neutral	Decrease	Neutral	Not Tolerated	Neutral	Neutral	Neutral	Neutral	Synonymous
	N253S	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	Neutral	Synonymous
	S542N	BENIGN	INCREASE	Neutral	Increase	Neutral	Not Tolerated	Neutral	Neutral	Neutral	Disease	Synonymous
	S555N	BENIGN	DECREASE	Neutral	Decrease	Neutral	Not Tolerated	Effect	Neutral	Neutral	Neutral	Synonymous
	S590N	BENIGN	DECREASE	Neutral	Decrease	Neutral	Not Tolerated	Effect	Neutral	Neutral	Disease	Synonymous
	I604V	BENIGN	DECREASE	Neutral	Increase	Neutral	Tolerated	Neutral	Neutral	Neutral	Neutral	Synonymous
	Y605F	PROBABLY DAMAGING	DECREASE	Neutral	Increase	Neutral	Not Tolerated	Effect	Deleterious	Disease	Disease	Non- Synonymous
	S608P	BENIGN	INCREASE	Neutral	Increase	Neutral	Tolerated	Neutral	Neutral	Neutral	Neutral	Synonymous
	E696D	PROBABLY DAMAGING	DECREASE	Neutral	Decrease	Neutral	Not Tolerated	Effect	Deleterious	Neutral	Neutral	Non- Synonymous
	I724M	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	Neutral	Synonymous
	SRY											
	V14G	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
	Q17H	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Effect	Neutral	Neutral	NA	Synonymous
	T19N	BENIGN	INCREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
	L29S	BENIGN	DECREASE	Neutral	Decrease	Neutral	Not Tolerated	Effect	Neutral	Neutral	NA	Synonymous
	H45N	BENIGN	INCREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
	V54I	BENIGN	DECREASE	Neutral	Increase	Neutral	Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
	V63L	BENIGN	DECREASE	Deleterious	Decrease	Disease	Not Tolerated	Effect	Deleterious	Disease	NA	Non- Synonymous
	W64G	BENIGN	DECREASE	Deleterious	Decrease	Disease	Not Tolerated	Effect	Deleterious	Disease	NA	Non- Synonymous
	R68Q	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
	R69K	BENIGN	DECREASE	Deleterious	Decrease	Disease	Not Tolerated	Effect	Deleterious	Disease	NA	Non- Synonymous
	R70Q	BENIGN	DECREASE	Deleterious	Decrease	Disease	Not Tolerated	Effect	Deleterious	Disease	NA	Non- Synonymous
	V72L	BENIGN	INCREASE	Neutral	Increase	Neutral	Not Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
	D83K	BENIGN	DECREASE	Neutral	Decrease	Disease	Not Tolerated	Effect	Deleterious	Disease	NA	Non- Synonymous

	W92G	BENIGN	DECREASE	Deleterious	Decrease	Disease	Not Tolerated	Effect	Deleterious	Disease	NA	Non-Synonymous
	A112S	BENIGN	DECREASE	Neutral	Decrease	Disease	Not Tolerated	Effect	Neutral	Disease	NA	Non-Synonymous
	R128K	BENIGN	DECREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
	P132L	BENIGN	INCREASE	Neutral	Decrease	Neutral	Tolerated	Neutral	Neutral	Neutral	NA	Synonymous
	Q172H	BENIGN	DECREASE	Deleterious	Decrease	Disease	Not Tolerated	Effect	Neutral	Neutral	NA	Non-Synonymous
	K201R	BENIGN	DECREASE	Neutral	Increase	Neutral	Tolerated	Effect	Neutral	Neutral	NA	Synonymous
	A210E	BENIGN	DECREASE	Neutral	Decrease	Neutral	Not Tolerated	Effect	Neutral	Neutral	NA	Synonymous
	C214F	BENIGN	DECREASE	Neutral	Increase	Neutral	Tolerated	Effect	Neutral	Neutral	NA	Synonymous