

1 **Supplemetnary Table A.** Information of 20 microsatellite markers which used in this study

Locus	Dye	Chromosome	Allele range (bp)	Primer sequence (5'-3')	
				Forward / Reverse	
ADL0176	VIC	2	168 – 208	TTG TGG ATT CTT GGT GGT AGC TTC TCC CGT AAC ACT CGT CA	
LEI0096		2	216 – 250	GAT CAG ATT GGT TCC CTG TG TGG GTG AAG TTT CCT CGT AG	
LEI0135		28	122 – 154	CAC AAT GAA GGA TGA ATA GTG C AAT TCA CAG TTA CAC CTG AGG	
MCW0078		5	129 - 159	CCA CAC GGA GAG GAG AAG GTCT TAG CAT ATG AGT GTA CTG AGC TTC	
MCW0193		5	295 - 319	TAT TCA ATA GAG TTA CGC TGT C ATT ACG TCT GCA CCA GTA CAG	
MCW0240		4	165 – 195	CCA AAC CGG TGT CAC CTA CTG GGT TAT TTC TTC AGT GAC TTC C	
MCW0103		3	269 - 273	AAC TGC GTT GAG AGT GAA TGC TTT CCT AAC TGG ATG CTT CTG	
MCW0330		17	256 – 300	TGG ACC TCA TCA GTC TGA CAG AAT GTT CTC ATA GAG TTC CTG C	
ADL0278	NED	8	109 – 123	CCA GCA GTC TAC CTT CCT AT TGT CAT CCA AGA ACA GTG TG	
LEI0094		1	245 – 285	GAT CTC ACC AGT ATG AGC TGC TCT CAC ACT GTA ACA CAG TGC	
LEI0166		3	340 – 356	CTC CTG CCC TTA GCT ACG CA TAT CCC CTG GCT GGG AGT TT	
LEI0192		6	244 – 370	TGC CAG AGC TTC AGT CTG T GTC ATT ACT GTT ATG TTT AIT GC	
MCW0233		27	202 - 218	TCC AGC AGT AAG TAT AGC TGC TGT TAG CTG CAG GGT ATT AGC	
MCW0252		3	287 – 303	CTG CTC AAG CCC ATC GAC TTC C CGA TAA CAT CTG ACA CTG CC	
MCW0295		4	76 - 108	ATC ACT ACA GAA CAC CCT CTC ATG TAT GCA CGC AGA TAT CC	
MCW0322		13	238 - 258	GAT CTC CCT AGC TAC AAA CC CTT CCG CCT TCT TGA GAG TC	
LEI0099	PET	12	111 – 133	GAT CTG GCA GAA CAG AAA CAG ATA TTT CAC ACC TGA CCT GCG	
MCW0016		3	134 – 163	ATG GCG CAG AAG GCA AAG CGA TAT TGG CTT CTG AAG CAG TIG CTA TGG	
MCW0145		1	180 - 220	ACT TTA TTC TCC AAA TTT GGC T AAA CAC AAT GGC AAC GGA AAC	
MCW0037	6-FAM	3	152 - 158	ACC GGT GCC ATG AAT TAC CTA TTA GAA AGC TAC CAT GAC ACT GCG AAA	

3 **Supplementary Table B.** Matrix of D_A genetic distances observed among 22 chicken breeds

	RIR	WLG	CON	KNG	KNB	KNR	KNW	KNY	KNO	MGN	INK	INS	ING	KGPS	LYO	LCH	LBB	LOU	NPS	SBC	VTN	VNH	
RIR	0.000																						
WLG	0.455	0.000																					
CON	0.282	0.393	0.000																				
KNG	0.279	0.445	0.416	0.000																			
KNB	0.247	0.359	0.289	0.284	0.000																		
KNR	0.280	0.370	0.276	0.269	0.181	0.000																	
KNW	0.300	0.341	0.336	0.265	0.235	0.244	0.000																
KNY	0.317	0.422	0.294	0.236	0.235	0.178	0.235	0.000															
KNO	0.381	0.373	0.287	0.356	0.254	0.246	0.384	0.314	0.000														
MGN	0.457	0.175	0.444	0.503	0.439	0.455	0.462	0.458	0.441	0.000													
INK	0.360	0.413	0.355	0.351	0.324	0.266	0.328	0.283	0.333	0.449	0.000												
INS	0.457	0.405	0.447	0.368	0.426	0.313	0.355	0.346	0.405	0.443	0.221	0.000											
ING	0.389	0.432	0.379	0.388	0.334	0.285	0.337	0.344	0.423	0.486	0.244	0.279	0.000										
KGPS	0.306	0.328	0.243	0.336	0.277	0.224	0.325	0.260	0.330	0.373	0.355	0.408	0.371	0.000									
LYO	0.378	0.445	0.414	0.336	0.358	0.315	0.389	0.309	0.366	0.448	0.210	0.230	0.294	0.334	0.000								
LCH	0.349	0.497	0.353	0.399	0.347	0.332	0.387	0.289	0.402	0.483	0.313	0.343	0.309	0.370	0.266	0.000							
LBB	0.427	0.371	0.421	0.427	0.420	0.349	0.375	0.363	0.413	0.410	0.267	0.305	0.265	0.387	0.302	0.326	0.000						
LOU	0.323	0.414	0.386	0.285	0.310	0.272	0.309	0.288	0.356	0.479	0.198	0.237	0.258	0.302	0.154	0.276	0.252	0.000					
NPS	0.237	0.292	0.219	0.292	0.195	0.172	0.248	0.215	0.231	0.332	0.193	0.265	0.257	0.171	0.223	0.228	0.241	0.179	0.000				
SBC	0.222	0.396	0.311	0.260	0.200	0.207	0.237	0.221	0.338	0.415	0.263	0.326	0.287	0.246	0.287	0.295	0.331	0.227	0.155	0.000			
VTN	0.313	0.365	0.308	0.322	0.255	0.198	0.306	0.266	0.294	0.421	0.157	0.231	0.232	0.257	0.208	0.242	0.215	0.152	0.131	0.203	0.000		
VNH	0.324	0.395	0.304	0.332	0.261	0.210	0.297	0.252	0.296	0.437	0.164	0.225	0.210	0.271	0.208	0.241	0.221	0.148	0.128	0.214	0.086	0.000	

4 RIR, Rhode Island Red; WLG, White Leghorn; CON, Cornish; KNG, Korean Grayish-brown; KNB, Korean Black; KNR, Korean Reddish-brown; KNW, Korean White; KNY, Korean

5 Yellowish-brown; KNO, Korean Ogye; MGN, Mongolian Nuthiin bor; INK, Indonesian KUB; INS, Indonesian Sensi; ING, Indonesian Gaok; KGPS, Kyrzyzstani GPS-H; LYO, Laotian York;

6 LCH, Lotian Chae; LBB, Laotian Black Bone; LOU, Latotian Ou; NPS, Nepalese Sakini; SBC, Sri Lankan Junglefowl; VTN, Vietnamese Ninh Hoa; VNH, Vietnamese Ninh Hoa.

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8 **Supplementary Table C.** Population of membership of each 22 chicken breeds genotypes with 20 microsatellite markers in the 20 inferred clusters using STRUCTURE analysis

POP	Cluster																				N
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
RIR	0.005	0.003	0.002	0.002	0.002	0.003	0.002	0.003	0.005	0.002	0.002	0.005	0.002	0.004	0.945	0.002	0.002	0.003	0.002	0.003	32
WLG	0.002	0.003	0.002	0.005	0.003	0.006	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.003	0.002	0.002	0.002	0.951	0.002	0.002	32
CON	0.004	0.003	0.004	0.003	0.003	0.004	0.01	0.003	0.88	0.004	0.002	0.004	0.002	0.004	0.051	0.003	0.003	0.005	0.004	0.003	32
KNG	0.003	0.002	0.003	0.003	0.003	0.05	0.002	0.003	0.049	0.002	0.002	0.003	0.002	0.854	0.006	0.003	0.002	0.002	0.003	0.003	32
KNB	0.006	0.009	0.006	0.004	0.003	0.005	0.006	0.01	0.005	0.014	0.004	0.891	0.005	0.007	0.007	0.004	0.003	0.004	0.003	0.004	32
KNR	0.014	0.006	0.019	0.006	0.003	0.006	0.008	0.845	0.006	0.007	0.005	0.014	0.006	0.007	0.014	0.007	0.004	0.013	0.006	0.005	32
KNW	0.006	0.003	0.007	0.004	0.003	0.889	0.003	0.005	0.007	0.007	0.003	0.009	0.004	0.008	0.009	0.007	0.003	0.016	0.003	0.003	32
KNY	0.01	0.007	0.878	0.005	0.004	0.007	0.01	0.01	0.011	0.006	0.003	0.008	0.004	0.008	0.008	0.004	0.004	0.006	0.003	0.005	32
KNO	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.005	0.004	0.924	0.002	0.01	0.005	0.005	0.003	0.003	0.002	0.013	0.002	0.002	32
MGN	0.005	0.004	0.003	0.004	0.004	0.002	0.003	0.002	0.002	0.003	0.003	0.003	0.002	0.05	0.005	0.006	0.003	0.889	0.004	0.005	9
INK	0.008	0.008	0.01	0.051	0.05	0.02	0.003	0.009	0.008	0.019	0.472	0.007	0.027	0.053	0.007	0.108	0.098	0.005	0.024	0.012	7
INS	0.005	0.005	0.006	0.009	0.083	0.014	0.003	0.008	0.003	0.005	0.02	0.003	0.006	0.008	0.003	0.008	0.795	0.006	0.006	0.005	8
ING	0.007	0.006	0.024	0.396	0.015	0.006	0.004	0.01	0.004	0.005	0.021	0.011	0.018	0.005	0.011	0.019	0.407	0.005	0.012	0.016	8
KGPS	0.012	0.018	0.009	0.005	0.003	0.006	0.863	0.007	0.01	0.005	0.005	0.006	0.005	0.01	0.01	0.005	0.003	0.005	0.004	0.007	24
LYO	0.007	0.005	0.01	0.011	0.634	0.004	0.004	0.006	0.004	0.012	0.013	0.005	0.126	0.007	0.004	0.008	0.034	0.003	0.005	0.101	7
LCH	0.006	0.007	0.008	0.008	0.012	0.005	0.003	0.005	0.006	0.009	0.008	0.023	0.002	0.007	0.006	0.009	0.01	0.003	0.014	0.849	7
LBB	0.003	0.005	0.003	0.084	0.006	0.003	0.002	0.002	0.002	0.002	0.007	0.002	0.003	0.003	0.003	0.093	0.088	0.006	0.676	0.006	11
LOU	0.02	0.005	0.017	0.043	0.248	0.009	0.009	0.012	0.005	0.013	0.038	0.011	0.253	0.019	0.007	0.056	0.055	0.003	0.152	0.026	10
NPS	0.086	0.297	0.012	0.088	0.026	0.006	0.049	0.01	0.018	0.03	0.061	0.018	0.013	0.015	0.013	0.144	0.019	0.017	0.026	0.053	27
SBC	0.683	0.037	0.032	0.014	0.008	0.017	0.006	0.01	0.011	0.006	0.014	0.026	0.006	0.035	0.022	0.034	0.009	0.006	0.007	0.018	15
VTN	0.017	0.015	0.005	0.05	0.009	0.004	0.006	0.01	0.006	0.006	0.521	0.011	0.168	0.014	0.006	0.076	0.017	0.009	0.028	0.021	25
VNH	0.008	0.028	0.011	0.041	0.018	0.006	0.012	0.013	0.014	0.015	0.388	0.016	0.067	0.012	0.006	0.267	0.038	0.005	0.018	0.018	23

9 RIR, Rhode Island Red; WLG, White Leghorn; CON, Cornish; KNG, Korean Grayish-brown; KNB, Korean Black; KNR, Korean Reddish-brown; KNW, Korean White; KNY, Korean

10 Yellowish-brown; KNO, Korean Ogye; MGN, Mongolian Nuthiin bor; INK, Indonesian KUB; INS, Indonesian Sensi; ING, Indonesian Gaok; KGPS, Kyrzyzstani GPS-H; LYO, Laotian York;

11 LCH, Lotian Chae; LBB, Laotian Black Bone; LOU, Latotian Ou; NPS, Nepalese Sakini; SBC, Sri Lankan Junglefowl.

12 Maximum numerical value for each breeds are in bold.