

Supplementary information

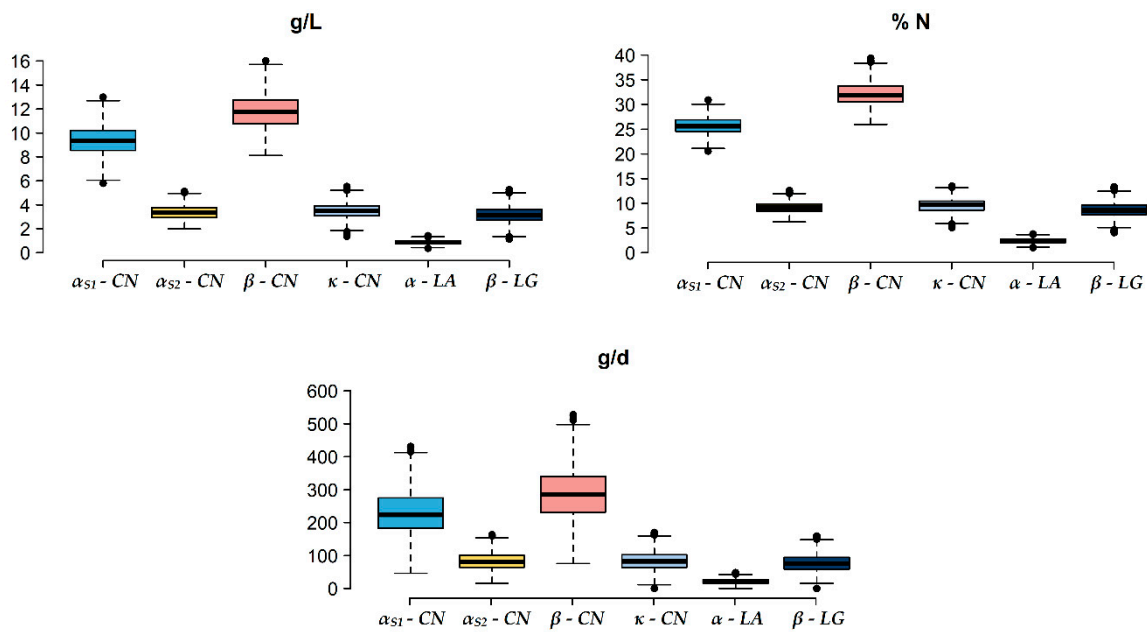


Figure S1. Boxplot of the phenotypic values for milk protein fractions casein fractions (α_{s1} , α_{s2} , β , and κ - CN) and whey proteins (α - LA and β - LG) expressed as i) gram per liter of milk (g/L); ii) percentage of total milk nitrogen content (%N) and iii) gram secreted per day (g/d) after phenotypic control.

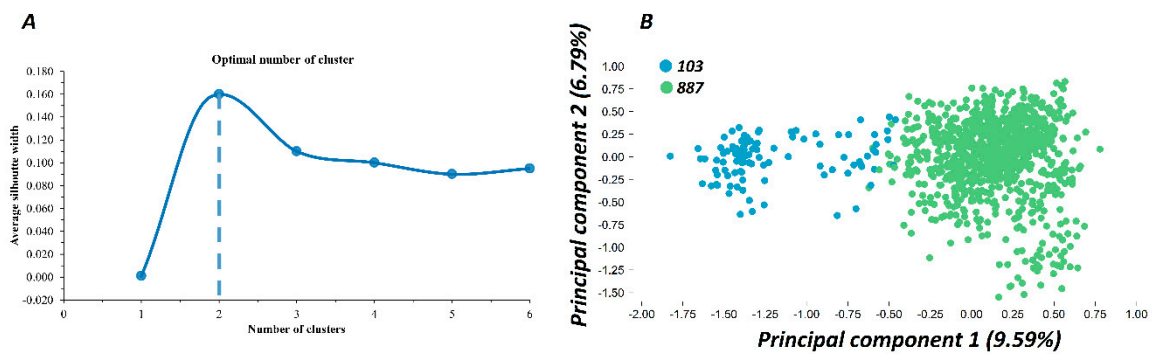


Figure S2. (A) Number of k clusters to identify the population structure and (B) A principal components analysis revealed two breeding subgroups of Brown Swiss cattle based on the genomic kinship coefficient.

Table S1. Estimates of environmental correlation for milk protein fractions using genomic information.

<i>Protein fractions contents (g/L)</i>							
	MY	α_{S1} -CN	α_{S2} -CN	β -CN	κ -CN	α -LA	β -LG
MY	-	-0.36 (0.005)	-0.27 (0.003)	-0.25 (0.005)	-0.20 (0.001)	-0.03 (0.003)	-0.32 (0.005)
α_{S1} -CN		-	0.47 (0.050)	0.63 (0.045)	0.31 (0.055)	0.24 (0.066)	0.56 (0.033)
α_{S2} -CN			-	0.50 (0.045)	0.23 (0.071)	0.33 (0.071)	0.55 (0.043)
β -CN				-	-0.48 (0.031)	0.27 (0.046)	0.44 (0.045)
κ -CN					-	-0.24 (0.032)	0.31 (0.028)
α -LA						-	0.39 (0.037)
β -LG							-
<i>Protein fractions proportion (%N)</i>							
	CP	α_{S1} -CN	α_{S2} -CN	β -CN	κ -CN	α -LA	β -LG
CP	-	0.04 (0.002)	0.15 (0.001)	-0.21 (0.006)	0.08 (0.009)	-0.10 (0.008)	0.05 (0.005)
α_{S1} -CN		-	0.23 (0.077)	-0.19 (0.012)	0.38 (0.063)	0.02 (0.036)	0.13 (0.060)
α_{S2} -CN			-	-0.29 (0.014)	0.27 (0.046)	0.15 (0.023)	0.29 (0.053)
β -CN				-	-0.15 (0.012)	0.04 (0.048)	-0.19 (0.020)
κ -CN					-	-0.01 (0.011)	-0.12 (0.026)
α -LA						-	0.28 (0.056)
β -LG							-
<i>Protein fractions daily yield (g/d)</i>							
	-	α_{S1} -CN	α_{S2} -CN	β -CN	κ -CN	α -LA	β -LG
α_{S1} -CN	-	-	0.84 (0.004)	0.93 (0.015)	0.82 (0.003)	0.79 (0.012)	0.85 (0.003)
α_{S2} -CN			-	0.83 (0.019)	0.69 (0.005)	0.73 (0.009)	0.81 (0.010)
β -CN				-	-0.83 (0.029)	0.79 (0.009)	0.83 (0.076)
κ -CN					-	0.70 (0.004)	0.73 (0.003)
α -LA						-	0.76 (0.017)
β -LG							-

CP: Crude protein (g/L); MY: Milk yield (kg/d); CN: Casein; β -LG: β - lactoglobulin; α -LA: α - lactalbumin; g/d: Grams of protein secreted per day; %N: Percentage of nitrogen; g/L: Grams per L of milk.

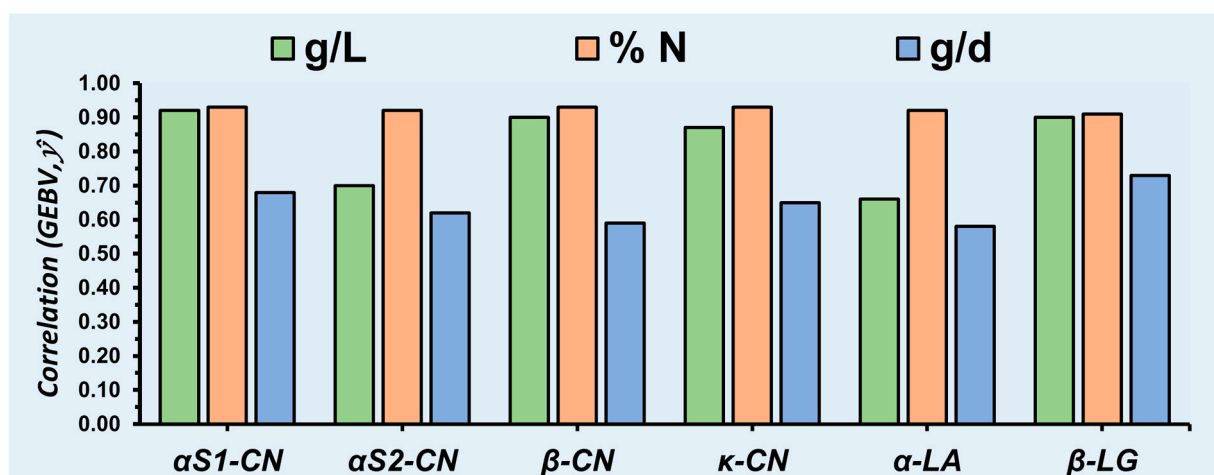


Figure S3. Predictive ability assessed in the multi-trait model by Pearson's correlations between genomic breeding values (GEBV) and adjusted phenotypes (y^*) for milk protein fractions expressed as grams per liter of milk (g/L), percentage of nitrogen (%N) and grams per day (g/d).