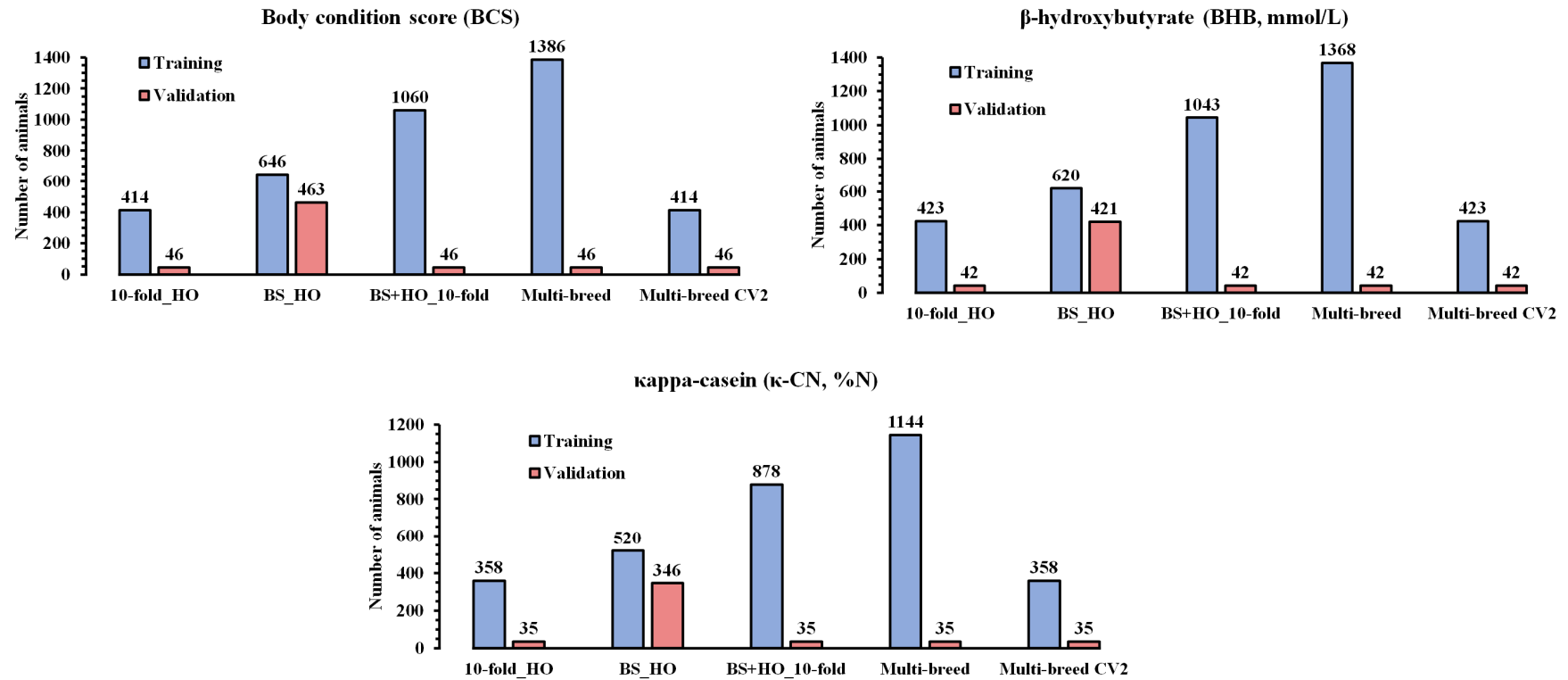
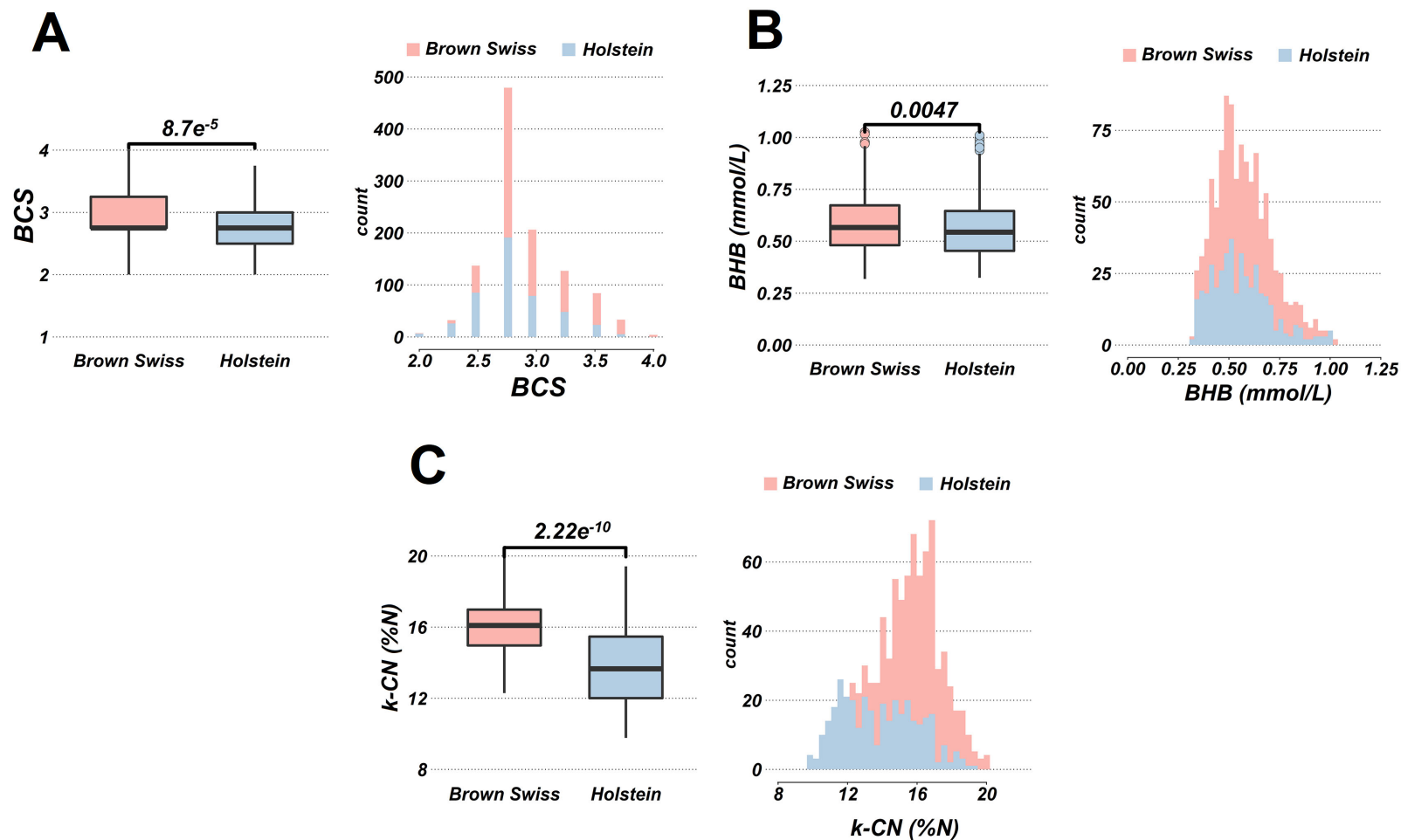


## Supplementary information



Supplementary Figure S1. Number of animals considered as training population and validation set for Body condition score (BCS),  $\beta$ -hydroxybutyrate (BHB, mmol/L), and kappa casein ( $\kappa$ -CN, %N) using different CV schemes: 10-fold\_HO, BS\_HO, BS+HO\_10-fold, Multi-breed and Multi-breed CV2.



Supplementary Figure S2. Boxplot and histogram of the phenotypic values for body condition score (BCS – A), blood  $\beta$ -hydroxybutyrate (BHB – B), and  $\kappa$ -casein expressed as %N ( $\kappa$ -CN – C), respectively for across-breed cross-validation design (BS\_Holst), in which the Brown-Swiss was assigned as training set and Holstein as validation set.