

Table S4. Time required in cycle 0 in four real data sets for the genomic selection index ( $L_{GSI}$ ) and the phenotypic selection index ( $L_{PSI}$ ) to complete the selection cycle; correlation or accuracy ( $\rho_{H,GSI}$ ) between the net genetic merit ( $H$ ) and the genomic selection index (GSI) and the square root of the heritability of phenotypic selection index ( $h_{PSI}$ ). These parameters were used to obtain the right-hand side ( $\frac{\rho_{H,GSI}}{h_{PSI}} L_{PSI}$ ) of the inequality formula of Technow *et al.* (2013). The left-hand side of this inequality ( $L_{GSI}$ ) formula was equal to 1.5 in all selection cycles.

Real data set	$L_{GSI}$	$L_{PSI}$	$\rho_{H,GSI}$	$h_{PSI}$	$\frac{\rho_{H,GSI}}{h_{PSI}} L_{PSI}$
3	1.5	4.0	0.89	0.80	4.44
4	1.5	4.0	0.59	0.64	3.70
5	1.5	4.0	0.62	0.63	3.91
6	1.5	4.0	0.72	0.72	3.98