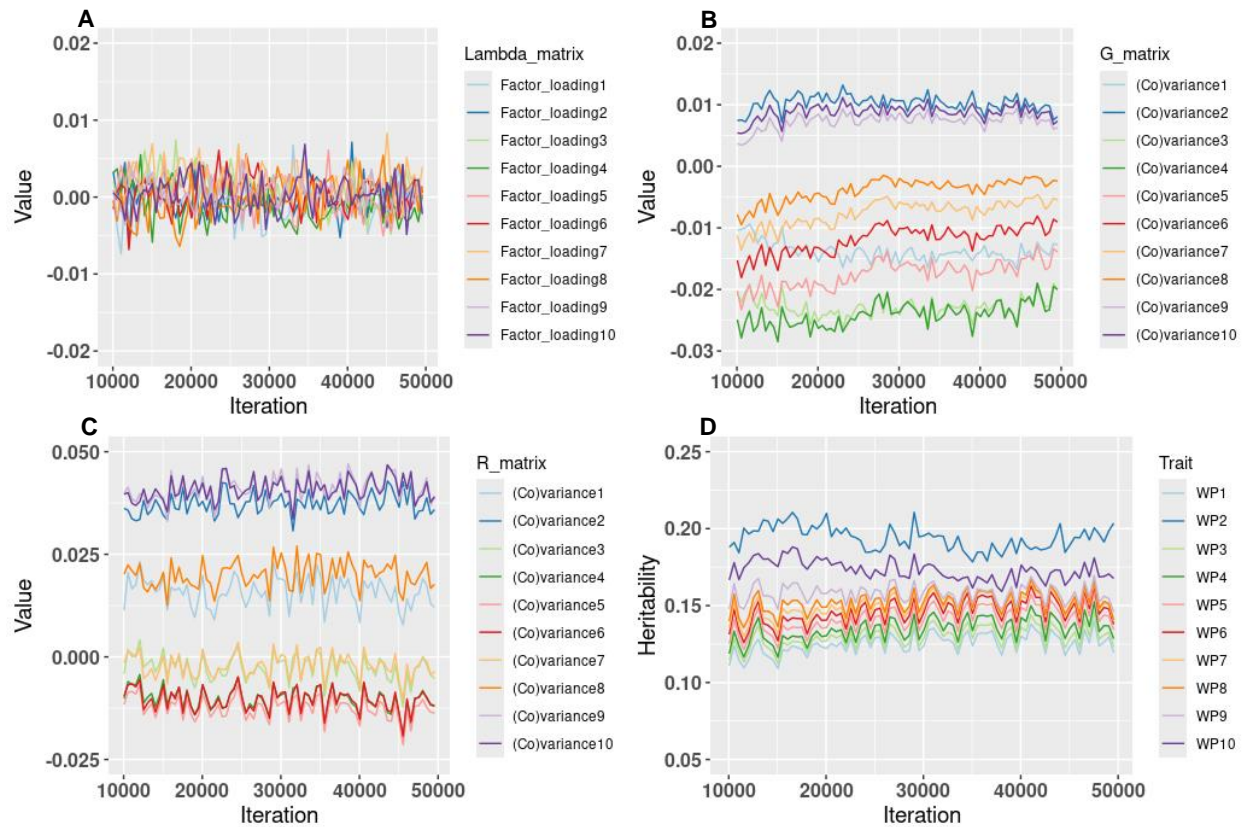


**Table S1.** The number of records of milk mid-infrared (MIR) spectra, fat percentage (Fat), methane (CH<sub>4</sub>), and somatic cell score (SCS) within the first parity (number of total animals is 3,302)

Month	1	2	3	4	5	6	7	8	9	10	11
MIR	2,681	2,820	2,781	2,750	2,660	2,652	2,627	2,573	2,446	2,261	1,604
Fat	2,681	2,820	2,781	2,750	2,660	2,652	2,627	2,573	2,446	2,261	1,604
CH <sub>4</sub>	2,679	2,820	2,781	2,750	2,660	2,652	2,627	2,573	2,446	2,261	1,585
SCS	2,680	2,817	2,778	2,750	2,660	2,652	2,627	2,573	2,446	2,261	1,603



**Figure S1.** Example trace plot of the 800 saved MCMC samples for 4 estimated parameters. **A:** Trace plot of 10 lambda factors loading. **B:** Trace plot of 10 variances or covariances in additive genetic matrix (G matrix). **C:** Trace plot of 10 variances or covariances in residual matrix (R matrix). **D:** Trace plot of heritability of 10 milk mid-infrared wavepoints (WP).