**Additional file 4.** The genomic inflation factor (Lambda) for the test statistic (P-value) from the GWAS methods using generalized linear mixed model accounting for reliability values associated with the de-regressed proofs. The traits are direct calf survival (cow; SCSc); direct calf survival (heifer; SCSh); direct calving ease (cow; SCEc); direct calving ease (heifer; SCEh); maternal calf survival (cow; CSc); set of rear legs (SRL): calf survival (heifer) (CSh); daughter calving ability (DCA); heel depth (HD); calving ease (cow) (CEc); pin setting (PS); foot angle (FAN); calving ease (heifer) (CEh); leg rear view (LRV); median suspensory ligament (MSL); udder texture (UT); feet & legs (FL); rear attachment width (RAW); chest width (CW); rump (RU); rear attachment height (RAH); leg side view (LSV); mammary system (MS); loin strength (LS); angularity (ANG); height at front end (FE); conformation (CONF); fore udder attachment (FA); teat length (TL); rear teat placement (RTP); calving ability (CA); bone quality (BQ); front teat placement (FTP); body depth (BD); pin width (PW); dairy strength (DS); rump angle (RAN); udder depth (UD); and stature (ST).

