

**Supplemental Figure S1.** Variance explained by markers (Chip heritability) for energy balance (EB), DMI, and ECM across the first 180 DIM. Lines represent daily estimates obtained from the univariate GWAS null model.

**Supplemental Figure S2.** Genomic correlations between traits across the first 180 DIM for energy balance (EB), DMI, and ECM. Estimates were obtained from bivariate GWAS null models.

**Supplemental Figure S3.** Three-dimensional animated Manhattan-Plots depicting the results of univariate GWA analysis of energy balance (EB). The x- and y-axis represent genomic coordinate (UMD3.1) and negative decadic logarithm of the p-value, respectively. The z-axis represents lactation day (DIM). Only results with  $-\log_{10}(p) \geq 4$  are shown, larger dots indicate genome-wide significant associations.

**Supplemental Figure S4.** Three-dimensional animated Manhattan-Plots depicting the results of univariate GWA analysis of dry-matter-intake (DMI). The x- and y-axis represent genomic coordinate (UMD3.1) and negative decadic logarithm of the p-value, respectively. The z-axis represents lactation day (DIM). Only results with  $-\log_{10}(p) \geq 4$  are shown, larger dots indicate genome-wide significant associations.

**Supplemental Figure S5.** Three-dimensional animated Manhattan-Plots depicting the results of univariate GWA analysis of energy-corrected milk (ECM). The x- and y-axis represent genomic coordinate (UMD3.1) and negative decadic logarithm of the p-value, respectively. The z-axis represents lactation day (DIM). Only results with  $-\log_{10}(p) \geq 4$  are shown, larger dots indicate genome-wide significant associations.

**Supplemental Figure S6.** Three-dimensional animated Manhattan-Plots depicting the results of bivariate GWA analysis of energy balance (EB) and dry-matter-intake (DMI). The x- and y-axis represent genomic coordinate (UMD3.1) and negative decadic logarithm of the p-value, respectively. The z-axis represents lactation day (DIM). Only results with  $-\log_{10}(p) \geq 4$  are shown, larger dots indicate genome-wide significant associations.

**Supplemental Figure S7.** Three-dimensional animated Manhattan-Plots depicting the results of bivariate GWA analysis of energy balance (EB) and energy-corrected milk (ECM). The x- and y-axis represent genomic coordinate (UMD3.1) and negative decadic logarithm of the p-value, respectively. The z-axis represents lactation day (DIM). Only results with  $-\log_{10}(p) \geq 4$  are shown, larger dots indicate genome-wide significant associations.

**Supplemental Figure S8.** Three-dimensional animated Manhattan-Plots depicting the results of bivariate GWA analysis of dry-matter-intake (DMI) and energy-corrected milk (ECM). The x- and y-axis represent genomic coordinate (UMD3.1) and negative decadic logarithm of the p-value, respectively. The z-axis represents lactation day (DIM). Only results with  $-\log_{10}(p) \geq 4$  are shown, larger dots indicate genome-wide significant associations.